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TOWARD IMPROVING PH.D. PROGRAMS

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TOWARD IMPROVING PH.D. PROGRAMS

By
ERNEST V. HOLLIS

*Prepared for the
Commission on Teacher Education*

AMERICAN COUNCIL ON EDUCATION
Washington, D.C.
1945

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Foreword

AT ONE of its earliest meetings the Commission on Teacher Education considered what, if anything, it might wisely undertake to do with respect to various questions relating to the preparation of college teachers. It agreed that these questions were important. It knew that college leaders were by no means wholly satisfied with the influence of graduate schools on the men and women who, after receiving the doctor's degree, joined their teaching staffs. Moreover it realized that the quality of college teaching is always a critical factor in determining the effectiveness of the education of teachers for the elementary and secondary schools, with whose preparation and in-service growth it was predominantly concerned. For these reasons the Commission determined to give such attention as proved feasible to problems of graduate practice.

The Commission was never able to study these problems as vigorously as it would have wished. For one reason, the special funds that would have been necessary to support any large attack proved unobtainable. It did find it possible, however, to engage in a number of activities and to secure access to a number of studies that served to throw considerable new light on the situation and to delineate the issues more sharply. This book is a report about those activities and studies. It describes and analyzes them and offers, especially in its concluding chapter, suggestions designed to point the way toward improving Ph.D. programs. Because the work of preparing college teachers is the task of graduate schools that do not sharply distinguish this function from others which they normally perform, it has been necessary to consider the situation of graduate schools as a whole.

This report has been prepared by Ernest V. Hollis who became a field coordinator on the staff of the Commission in 1940. Dr. Hollis conducted most of the conferences referred to,

planned and carried out the exhaustive enquiry respecting the placement of persons who received the doctorate during the decade of the 1930's, and gathered the expressions of opinion that are reproduced for the most part in Chapter V. A former member of the faculty of the School of Education at the College of the City of New York, Dr. Hollis has since early 1944 been with the United States Office of Education as principal specialist in higher education.

The Commission wishes to express its appreciation to Dr. Hollis, as well as to the many representatives of universities, four-year colleges, junior colleges, and systems of public schools without whose generous cooperation he could not have prepared his report. Special reference should be made to the deans of graduate schools who demonstrated their concern with the problems at issue by giving much time to providing statistical data, to filling out questionnaires, and to participating in conferences. The Commission believes that Dr. Hollis' report will stir wide interest. The author has of course been free to offer his own interpretations and express his own views; he assumes responsibility for all statements made. The manuscript has had the benefit of suggestions and criticisms from staff colleagues, from three members of the Commission—Harry M. Gage, Fred J. Kelly, and Frank W. Thomas—who constituted an advisory committee, and from others. As in the case of all Commission volumes where the contrary is not explicitly stated, the action of the director in recommending, and of the Commission in authorizing, publication of this report does not necessarily imply indorsement of all that is contained therein.

KARL W. BIGELOW
Director

Introduction

A WORD is in order at the outset about the nature of the material discussed in this report. The evidence presented for consideration is of three kinds. First there is a historical sketch to show that the dynamics of American graduate schools have their origin in cultural conditioning. This is followed by an analysis of the preparation and 1940 placement of a decade's doctoral graduates. The effectiveness of current graduate education is then appraised by compilations of the opinion of producing and employing groups, and of recipients of the Ph.D. degree themselves, especially as to how programs and procedures could be improved. The whole of this evidence is then used as a base for a series of general proposals representing the author's convictions.

It will be noted that the study is thus in large measure a group venture. Persons responsible for educating and employing doctoral graduates have pooled their experience in the interests of learning how to do a better job. The primary responsibility of the Commission's representative in this connection has been that of analysing this composite experience, sifting and weighing the issues disclosed, and indicating the implications for future policy. The testimony to be presented has, however, not been selected for the purposes of an advocate or to support a preconceived theory. No attempt has been made to minimize the uncertainty and even discord that actually characterize the current situation in graduate practice. Multiple testimony of this kind seldom adds up to wholesale indictment or vindication. In this instance it will be seen to contain much hearty approval as well as exasperation.

For all its cooperative nature, on the other hand, the study has been guided and its interpretation influenced by two fundamental assumptions of the author. Neither is fully accepted by a majority of all graduate faculties. The first defines the graduate

school of arts and sciences as an unspecialized professional institution, the primary responsibility of which is to help doctoral candidates acquire the basic education needed for such scholarly careers as placement data show they tend to follow. According to this position, graduate schools should be interested in enriching all vital aspects of scholarly preparation rather than be preoccupied solely with developing ability in research. The second assumption, deriving as a corollary from the first, holds that members of graduate faculties should work with students individually and in groups on the basis of their vocational purposes and in keeping with their ascertainable aptitudes and backgrounds. Acceptance of the philosophy implicit in this position means recognizing that most graduate students are not wholly capable of self-direction.

The first chapter of this report tries to make explicit the institutional dynamics that must be taken into account in modifying any program or procedure in graduate education. Leaders in this field need to understand the long-range forces and circumstances that have shaped American graduate practice, with special reference to the impact of these forces on the institution for which they are responsible. To be realistically equal to any contingency, proposed innovations must take cognizance of the social pressures which direct the course of action open to graduate schools. Moreover, sound judgment as to what constitutes a feasible change in a particular situation requires in addition an intimate acquaintance with the organization and functioning of the university in question. The general intent of the chapter is to supply material calculated to give clues and insights for managing the processes of group action so that new ideas may be incorporated into an ongoing program of graduate education.

Chapters II and III are devoted to a statistical analysis of the educational and employment history of 22,509 persons who were awarded the Ph.D. degree during the decade of 1930-31 to 1939-40. The data are distributed in ways likely to make them useful for normative purposes and for supplying suggestions for program change. While the facts disclosed are interesting in many ways, the main purpose in presenting them here is

to demonstrate the relative responsibility of graduate schools for preparing personnel for the several fields of education and for scholarly careers outside of education. In one section of Chapter III a special comparison is made between the employment status of holders respectively of the Ph.D. in education and the Ed.D. degree.

Chapters IV and V discuss the opinion of employers in education, government, and industry with respect to what graduate schools should do to further a doctoral candidate's preparation for his chosen career. Surprisingly enough each group writes a very similar bill of particulars and when these are checked with the judgment of recent recipients of the doctorate, presented in Chapter VI, there is again found essential agreement. Nevertheless, there is likewise evident throughout considerable confusion and groping with respect to a number of specific graduate practices. While there is thus much food for thought in this collation of opinion, no student of graduate education would expect it to speak clearly and definitively on all issues. The final chapter offers the author's judgment as to the strength and direction of some of the major forces currently under way in graduate education. More specifically it presents suggestions for accelerating what he considers to be desirable developments in program and general procedure.

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I

Long-Range Forces that Have Shaped Doctoral Work

THOSE WHO would improve Ph.D. programs need some understanding of the forces and conditions that have shaped practice respecting the degree as it is given now in American universities. In our educational and cultural history are to be found the roots of those differences of opinion that characterize contemporary discussion of graduate work. Such differences have to do with the goals of doctoral study, with its content and method, and with the selection and guidance of candidates for the degree. Controversies respecting these matters are by no means novel; we need to know something of their background and of the reasons that account for changing emphases. It is necessary, therefore, to begin this book with a sketch designed to show the evolution of practice in American graduate schools so far as Ph.D. programs are concerned. The reader will understand, of course, that such a sketch cannot purport to deal with the whole range of graduate education, since it will not include consideration of that notable array of problems that relate to the master's degree. But it will endeavor to provide an adequate historical basis for what is to be dealt with in this volume.

An individual's whole theory of cultural values enters, often unconsciously, into the position he takes on particular issues in graduate work. History suggests that our convictions and practices in this area have been compounded of two antithetical educational traditions. Our most deeply ingrained folkways in higher education derive from the essentially aristocratic colonial college of liberal arts and have been 300 years in the making. Until at least the end of the nineteenth century such institutions

relied on sectarian authority and mental discipline for achieving their ends; they prescribed a fixed curriculum which emphasized the alleged fundamentals of knowledge and truth. Since the turn of the century the dominant pattern of college education has been one that provides for a strong major subject supported by one or more closely related minor subjects. Nevertheless, those who hold this conception still subscribe to many of the tenets of the older view. When it is remembered, the early history of Johns Hopkins University and Clark University notwithstanding, that the American graduate school still is primarily an extension of liberal arts education, it is not surprising to find that leaders in this field hold ideas of administration, curriculum, courses, assignments, recitations, and examinations that are significantly colored by the concepts governing undergraduate study in the arts and sciences. The college professor who gives graduate work on part time (the prevailing situation in the United States) almost inevitably carries into that activity much of the viewpoint developed through his contact with undergraduates.

The nineteenth-century German university ideals of freedom in learning, teaching, research, and the publication of findings are the second element in the double tradition in higher education that has contributed to the conflict in our graduate standards. Those who hold steadfastly to these ideals emphasize the importance of developing initiative, self-direction, and self-reliance. At the graduate level this conception of scholarship calls for a body of teachers and scholars who work informally and independently, in small groups or individually, in seminars, laboratories, libraries, and field situations. Progress is not measured by class attendance, the preparation of day-to-day assignments, quizzes, academic credits, and the other items of typical undergraduate work. Rather it is measured by the power a candidate demonstrates in performing the scholarly task he has undertaken. The average professor finds it easy to give intellectual assent to these ideals of education but when he comes to gauge performance, or to set standards and criteria for this

activity, he tends to fall back on the quantitative paraphernalia of the undergraduate college.

The development of graduate schools, to be examined in current cross section in succeeding chapters, falls naturally into four historical periods: from the time of Thomas Jefferson to the founding of Johns Hopkins University in 1876, the later pioneering period from 1876 to 1900, the era of standardization from the turn of the century to 1918, and the period of changing purpose that accompanied quantitative expansion between the two world wars.

THE DEVELOPMENT OF GRADUATE EDUCATION BEFORE 1876

Perhaps the quickest way in which to describe the economic, religious, political, intellectual, and other social forces that shaped early graduate work in the United States is to look backwards at them from the standpoint of the founders of Johns Hopkins University—our first full-fledged graduate school. Why did this venture succeed instantly and serve to bring to a head the sporadic attempts at graduate education offered before that time at such universities as Columbia, Cornell, Harvard, Michigan, Pennsylvania, and other established institutions? This quick flowering of Johns Hopkins must be attributed to foresight in adjusting intelligently to social conditions and to skill in protecting the new school from the crosscurrents of contemporary controversy, rather than to the absence of such opposing doctrines as are now at work in American life. As Sidney Lanier put it in his "Ode to the Johns Hopkins University":

Yet not from Jove's unwrinkled forehead sprung,
But longtime dreamed, and out of trouble wrung,
Foreseen, wise-planned, pure child of thought and pain,
Leapt our Minerva from a mortal brain.¹

On the independent recommendations of Presidents Charles W. Eliot of Harvard University, Andrew D. White of Cornell University, and James B. Angell of the University of Michigan,

¹ Mrs. Sidney Lanier, ed., *Poems of Sidney Lanier* (New York: Charles Scribner and Sons, 1920), p. 108.

the Johns Hopkins trustees selected in 1876 as head of their new university Daniel Coit Gilman—at the time president of the University of California and formerly associated for seventeen years with various enterprises at Yale University. The trustees left to Gilman and his professional advisers the decision as to the institution's precise nature and scope. At this period, most American graduate students were flocking to European universities, especially to those in Germany. Gilman wanted to develop Johns Hopkins to compete with these universities by reproducing most of their good characteristics and at the same time serving contemporary needs in the United States to a degree not possible for a foreign institution. He expected that in such a university all branches of knowledge would be taught and investigated, that professors would be free to formulate conclusions and offer instruction in accordance with their findings, and that students would be at liberty to take up whatever subject they chose as best suited to their interests and capacities.

Gilman realized that this was a hazardous undertaking and leaned heavily on the advice of professional colleagues both here and abroad, but especially on Eliot, White, and Angell. The graduate school that seemed fairly to leap into being was the product of their considered planning. These advisers knew how deeply the social forces at war in their own institutions were embedded in our history, and as practical administrators they understood the importance of protecting the new venture from violent collision with adverse educational, religious, and political pressure. To achieve these ends the new graduate school was developed without sectarian or governmental control; there was no school of theology and no traditional college of liberal arts. The basis for these decisions should be presented more in detail.

Warnings from the experience of others

The significance of the planning done at Johns Hopkins becomes apparent in view of the experience of earlier American colleges and universities in dealing with social forces. For instance, the sectarian clientele of the College of William and

Mary had quickly counteracted the attempt made in 1779 by James Madison and Thomas Jefferson to modify the prescribed Oxford curriculum then in vogue and orient it toward the scientific, philosophical, and other intellectual stirrings of the European enlightenment. Jefferson says of their experience on the board of visitors:

... we secured the abolition of two professorships of divinity and oriental languages, and the substitution of a professorship of Law and Police, one of Anatomy, Medicine, and Chemistry, and one of Modern Languages; and, the charter confining us to six professorships, we added the Law of Nature and of Nations and Fine Arts to the duties of the Morals professor, and Natural History to the professor of Mathematics and Natural Philosophy.²

But college and church historians have documented the fact that neither the educators nor the churchmen of the day were ready for Jefferson's reforms, and the results he and Madison hoped for were not realized. In 1825 Jefferson tried again, with only moderate success, to secure the same ends through establishing the University of Virginia along practical lines and free of conservative church and college influence. Subsequent developments again proved, however, that traditions in higher education were more powerful than Jefferson's ideals for shaping curricula and procedures at this institution.

Advocacy of a nonsectarian college or university suited to industrial and agricultural needs, while remaining a minority movement, became more widespread and intense after the renewal of our cultural relations with Europe in the decades between 1812 and the Civil War. This cultural upsurge brought into American colleges a rising tide of professors who had visited or studied in German, British, and French universities, and they became earnest advocates of the freedom in learning and teaching which they had experienced abroad. At Harvard University in the 1830's, a group of professors under the leadership of George Ticknor and President Josiah Quincy were able to make some headway in introducing such ideals and in breaking the

² Thomas Jefferson Randolph, ed., *Memoirs, Correspondence and Private Papers of Thomas Jefferson, Late President of the United States* (London: Colburn and Bentley, 1829), Vol. I, p. 43.

strangle hold of a single prescribed curriculum. But in the next administration these beginnings were swallowed up in a sea of faculty inertia and opposition. The same outcome must be recorded for a more thoroughgoing and indigenous effort made at Brown University in the 1840's by President Francis Wayland and his associates.

The sponsors of Johns Hopkins University probably were influenced even more in their decision by the ill-fated efforts of President Henry Philip Tappan, during 1852-63, to transform the University of Michigan into an institution of the true German type. In his own words, Tappan sought

... to adapt the University to the present wants of the community. To this end a *scientific* course was organized, in distinction from a *classical* course; a school of engineering was instituted; a laboratory and observatory were erected; an agricultural school, and a school of military engineering were sought to be created. The University, as at present developed, is in part composed of the intermediate or pre-disciplinary course common to our colleges, and to the *gymnasias* of Germany; and in part of that which belongs to a university properly so called. And this must remain until all the parts of a just system of public education are fully developed in their order and relations. When this is accomplished, the University can become purely a university—an institution for professional study, for culminating studies in science and literature and for manly self-development.³

A considerable minority of the Michigan faculty were ready to support this program of evolution into a university, but in the end Tappan was forced out of office amidst a flood of abuse and censure in which he was charged with trying to Europeanize the university through un-American doctrines, with "imitating English aristocracy, German mysticism, Prussian imperiousness, and Parisian nonsensities." In the public press, indeed, Tappan was denounced as being "altogether the most foreignized specimen of an abnormal Yankee we have ever seen."⁴ While it may not be complimentary to their courage, it is small wonder that

³ H. P. Tappan, "Review of His Connection with the University of Michigan," in *University of Michigan Regents Proceedings, 1837-1864*, ed., Isaac Demmon (University of Michigan, 1915), p. 1123.

⁴ As quoted by R. Freeman Butts, *The College Charts its Course* (New York: McGraw-Hill Book Co., 1939), pp. 154-55.

the sponsors of the Johns Hopkins venture wanted to avoid conflict with these rampant political forces of frontier democracy and narrow nationalism.

The determination to establish a graduate school independent of the church, the state, and the arts college was undoubtedly increased by observing developments at Harvard, Cornell, and similar institutions in the decade following the Civil War. The prescribed classical curriculum at Harvard College had permitted the addition of scientific and technical subjects along with modern languages and literatures. But the instructional effectiveness of the faculty group led by Louis Agassiz and the crusading leadership of President Eliot were not enough to lift this break with tradition to the graduate level of work. A majority of the faculty declared that including vocational and professional courses lowered the standards of a genuinely liberal education and usurped funds heretofore dedicated to maintaining the ideals for which Harvard was founded. In response Eliot chided the arts faculty for being content to teach schoolboys only and pointedly remarked that they would never become even first-rate college teachers until they began to grow through research and teaching activities of their own at advanced levels. Despite these proddings Eliot, speaking at the twenty-fifth anniversary of the founding of Johns Hopkins, admitted that:

. . . the graduate school of Harvard University, started feebly in 1870-71, did not thrive until the example of Johns Hopkins forced our faculty to put their strength into the development of instruction for graduates. And what was true of Harvard was true of every other university in the land which aspired to create an advanced school of arts and sciences.⁵

The sponsors of Johns Hopkins were persuaded by the experience of Cornell University against expecting a new institution to be successful in developing concurrently a graduate and several undergraduate schools, even in an environment which, like that of Cornell, was protected from the excessive influence of state, church, and the traditional arts college. Cornell was so positively oriented toward the nation's developing agricultural and

⁵ *Celebration of Twenty-fifth Anniversary of the Founding of Johns Hopkins University* (Baltimore: Johns Hopkins University Press, 1902), p. 73.

industrial life that it opened, in 1858, with five parallel undergraduate curricula representing gradations from the "practical" or vocational through the technical-professional to the traditional pattern of liberal arts. So large a response was made to provisions for the immediate occupational needs of undergraduates that in 1868, a decade after the founding, the graduate school was still undeveloped; this despite the intelligent efforts of President White who had acquired his zeal for graduate work through serving on Tappan's staff at the University of Michigan. The readiness with which the country had responded to the ideas of Ezra Cornell and the provision of land-grant institutions, convinced the leaders at Johns Hopkins that, at least in its early stages, a graduate school would have to be protected from the praiseworthy but engulfing vocational interests of undergraduates.

The emerging modern emphasis

The decision to try out in the United States a graduate institution that would be as distinct from the college as continental universities were from the *lycée* and the *gymnasium*, and that would not be intellectually hampered by the dictates of sectarian and narrowly nationalistic groups, was not made on educational grounds alone. Gilman and his associates knew that the exercise of freedom in learning and teaching in Europe had led to the demand to "close the godless universities and depose the atheistic professors." They also knew that this demand arose because the universities produced and disseminated research on higher criticism of the Bible, the Darwinian theory of evolution, mechanistic explanations of the universe, and pragmatic philosophy and ethics. Many citizens both in Europe and the United States were convinced, or at least apprehensive, that these activities constituted threats to the existing order in religion, government, and society in general. The man in the street has always sensed lurking danger in any meddling with the folkways or any critical examination of what he thinks of as the eternal verities.

As part of their prudent planning, the Johns Hopkins group

naturally wanted to avoid all unnecessary conflict with these widespread social pressures, though without compromising the virile program they had envisioned to meet contemporary American needs. Hence their decision to omit a school of theology in the new university. Even so, the temper of the times was reflected in the criticisms of religious people in Baltimore and the rest of the country to the effect that the Johns Hopkins University inaugurated its program without an opening prayer but with a lecture by the Darwinian biologist, Thomas Huxley. "Huxley was bad enough; Huxley without a prayer was intolerable" is the way they put it.⁶ However, a good deal of sectarian opposition to the science program, which was to be the heart of the institution, was averted by centering this work on the sciences basic to the study of medicine. Public opinion trusted science in its capacity of improving the healing arts.

Medicine aside, Johns Hopkins selected for major emphasis what Gilman spoke of as the "modern humanities," that is to say the applied social and earth sciences, certain of the physical sciences, and the modern rather than the classical languages, literatures, and philosophies. This decision was in line with the incipient trend toward the newer fields then beginning to make itself felt both at home and abroad. Gilman and his associates had carefully studied the controversy in England in which John Henry Newman, Matthew Arnold, and their followers had defended the place of the classics in higher education against Herbert Spencer, Thomas Huxley, and their followers who had asserted that science provided the knowledge needed most by men and mankind.

Although the newer scientific and literary emphases had hardly made a start in English universities and were still at very rudimentary stages in continental universities, the group at Johns Hopkins decided to throw the weight of their institution on this side. They did this in the face of hostility from orthodox American educators and churchmen who believed that the classical studies contained the essence of truth, and who thought

⁶ Fabian Franklin, *The Life of David Coit Gilman* (New York: Dodd, Mead, and Co., 1910), p. 221.

of the mind as a series of faculties to be disciplined. It is commonly agreed in educational circles today that the important decisions made at this time continue to affect profoundly what is done in American higher education. They led to programs that helped shape the thought of a group of Johns Hopkins men whose influence is still great in the intellectual life of the United States. Among these may be counted Josiah Royce and John Dewey in philosophy; Cyrus Adler, G. Stanley Hall, and J. McKeen Cattell in psychology; Woodrow Wilson and Walter Hines Page in history and public affairs; Frederick Jackson Turner, John Spencer Bassett, Charles H. Haskins, and a score of others in history and political science.

The early doctorate of philosophy

As it was first awarded in the United States, the degree of doctor of philosophy was without stable form and void of integrity. Each institution followed its own inclination about conferring the Ph.D. whether *honoris causa* or as an earned degree. In 1861, Yale University granted the first earned doctor's degree on the basis of two years' work beyond college graduation but with much of the advanced study done away from the campus. By 1873 that institution had awarded twenty-three such degrees, above 90 percent of the American total up to that time. The University of Pennsylvania entered the lists in 1870 and in the early period conferred most of its earned Ph.D. degrees on medical students, while Columbia University began in 1875 by granting this degree in the School of Mines after one year of graduate study. Harvard's first Ph.D. was awarded in 1873 on the completion of two years' graduate work in residence. Between 1872 and 1876 not more than five institutions conferred the degree at all and the number of degrees granted in any one year ranged from four to eighteen. In 1876, the year when Johns Hopkins opened, the University of Pennsylvania reported to the United States commissioner of education the award of seven earned doctor's degrees; Harvard reported five, Syracuse three, Michigan two, and Illinois Wesleyan one.

The leaders of the new movement in graduate education faced an immediately discouraging situation in the tendency of all types of institution to confer the Ph.D. degree *honoris causa*. Between 1861 and 1876 the doctorate was indeed awarded more frequently on an honorary than on an earned basis, and it was not unusual for the same university to confer it both ways. Apparently New York University was the first to do this, in 1862, and the practice was widely imitated. In 1876 twenty institutions conferred twenty-six honorary Ph.D. degrees. According to the best estimates, 20 percent of all such degrees conferred before 1900 were honorary and most of them were awarded by struggling undergraduate colleges. Nevertheless, so important an institution as Princeton University granted sixty-seven honorary Ph.D. degrees as against twenty earned ones in the years from 1866 to 1896.

The reasoning that went into the planning for Johns Hopkins University may be summed up very briefly thus: Certain forward-looking educators had been interested, since the founding of the nation, in the intellectual developments particularly of the European enlightenment that were beginning to challenge the existing classical pattern of higher education. They had been consistently hampered in their attempts at curricular revision by the conservative influence of most contemporary churchmen, educators, and citizens. Furthermore, as certain institutions in the United States adjusted to the developing agricultural and industrial economy of the day and sought to meet local needs as they came to expression, their programs received their most determining directives from the vocational interests of undergraduates. The group interested in the new venture wished to make it comparable intellectually with the important continental universities. Consequently, the decision was made to concentrate on graduate work alone and to keep the institution distinct from the traditional college of liberal arts, and from all religious and political control. A special problem to these pioneers, since their major interest was high standards of advanced study, was afforded by the contemporary irresponsible practice in awarding the Ph.D. degree, either on an earned or an honorary basis.

THE LATER PIONEERING PERIOD, 1876 TO 1900

During the quarter-century following the founding of Johns Hopkins University, a dozen other institutions were sufficiently influenced by the standard it set to try, each in its own way, to give acceptable shape to its own rather formless graduate school. Especially did they try to stabilize the capricious and sprawling practice then being used in connection with the earned doctorate in philosophy. Off and on during this pioneering period, fifty institutions awarded the earned Ph.D. degree under conditions that varied from the most nebulous work through correspondence courses to one, two, or three years of genuine study in residence beyond the bachelor's degree. The slow progress made in this regard is indicated by the fact that, of the forty-eight institutions reporting its award as an earned degree to the United States commissioner of education in 1899, half were undergraduate colleges that conferred it on the basis of work of one sort or another away from the campus. Actually 35 percent of the 325 degrees reported in that year were so earned—for example, Taylor University in Indiana gave 14, Illinois Wesleyan University 11, and Gale College in Wisconsin 15.

Practical emphasis of the new movement

While there were no formal agreements among the American universities that sought to establish Ph.D. work after the German pattern, certain common purposes underlay their efforts. They were frankly eager to meet needs for the satisfaction of which approximately 300 out of a total of some 500 advanced graduate students at the time considered it necessary to go abroad. Student enrollment aside, they shared the long-range desire to have the apex of our educational system in the United States rather than in Europe and Britain where it still was in 1890. To achieve these ends American educators did not, however, propose to adopt foreign graduate school practices uncritically; rather, they wanted to select those procedures which they considered suited to the needs of contemporary American life. They were far more concerned about importing German

ideals of scholarship than about taking over European administrative machinery and conceptions of who should be admitted to graduate study.

Each of the dozen pioneering universities adapted German ideals of graduate work to the situation peculiar to itself. Institutional and faculty backgrounds varied as much as the insights and generalship of their leaders, and each faced a different combination of economic, political, sectarian, and other cultural pressures. Johns Hopkins and Clark universities were designed and succeeded as examples of how, under intelligently controlled conditions, one variant of the German graduate school could be established in the United States quickly, though the latter institution was handicapped by the fact that G. Stanley Hall could not secure adequate funds nor dissuade the founder from adding to the institution an undergraduate college. The degree had a slower and more indigenous development at Harvard, Yale, Columbia, Princeton, and Pennsylvania because of their church and colonial traditions. Graduate work at Cornell, Michigan, and the other state universities was spared the full impact of these hindering influences but they operated indirectly through the political opinion that held veto power over parts of their budget and program. The growth of graduate work at the University of Chicago was more rapid because the institution was relatively well financed and succeeded in controlling the forces that sought to make it a sectarian college.

The development of special fields of work in particular universities illustrates equally well how different standards of the Ph.D. degree came into being. The natural sciences developed in one way at Johns Hopkins and Pennsylvania because of strong medical schools; in another way at Cornell, Wisconsin, and most of the other state universities because local pressures came from agriculture and industry. Theological schools impelled Yale and Chicago to develop the classical languages while by design Cornell stressed modern languages and literatures.

Next in importance to impersonal social forces in conditioning any one of these ventures in graduate education was the vision and skill of a particular leader. For better or worse Hall

and the Clark University of his day were synonymous terms; the same is true of Eliot and Harvard, White and Cornell, Angell and Michigan. During his administration and for a score of years afterwards the University of Chicago was the embodiment of William Rainey Harper. Gilman so permeated Johns Hopkins that through its seminal influence he is today the patron saint of the American graduate school. These instances of course do not intend to support the theory that progress comes through *führers* or other types of "great man" leadership. Rather, these men were so responsive to the needs of their day that they became symbols of the less widely known scholars who were members of their faculties.

Without exception the leaders of this period advocated a program of research and instruction calculated to minister to the everyday needs of national and community life. They were not afraid of vocational, professional, or otherwise utilitarian studies. The squeamishness that now abounds in this regard emanates largely from liberal arts teachers of undergraduates who have come to have a voice in graduate affairs in most universities. In his inaugural address Gilman sounded a note that was reiterated generally by other presidents. He promised that Johns Hopkins would make for "less misery among the poor, less ignorance in the schools, less bigotry in the Temple, less suffering in the hospital, less fraud in business, less folly in politics." He believed that the attainment of such highly practical ends called for advanced study in many subjects for which graduate research had not before been customary, even in Germany.

For his new institution Gilman recommended attention to the biological sciences as already noted, especially those basic to medicine, and to what he called the modern humanities—"the study of man in his relations to society: history, jurisprudence, political economy, legislation, taxation; the study of the earth sciences: geodetical, topographical, meteorological, geological." He was emphatic in declaring that education should be included in his program as a field of graduate study:

I can hardly doubt that such arrangements as we are maturing

will cause this institution to be a place for the training of professors and teachers for the highest academic posts; and I hope in time to see arrangements made for unfolding the philosophy, principles, and methods of education in a way which will be of service to those who mean to devote their lives to the highest departments of instruction.⁷

It is of particular interest to note that Gilman believed college and university professors to be in need of special training, and that he early started some aspects of graduate work in education by bringing G. Stanley Hall to Johns Hopkins.

As has been said, the social vision and educational statesmanship of the pioneer group of university leaders was widely shared. Many universities accordingly developed graduate programs in modern languages and literatures, several of the social sciences, the fine arts, geography, psychology, and certain emerging specialties of the natural sciences not then being developed in German universities. That these emphases were not copied from Germany is made clear from the testimony of Friedrich Paulsen. Writing from personal experience and observation, this great German democrat and student of higher education, who received the doctorate in philosophy from the University of Berlin in 1870, has reported the narrow character of the graduate program at that institution at the time:

Convinced that I ought to cultivate at least some acquaintance with the natural sciences, I attended a course of lectures on physics by Helmholtz, who had recently accepted a call to Berlin. What I was out for—fundamental concepts and comprehensive ideas—he did not dispense.

After explaining that he fared better in chemistry and physiology, Paulsen continues:

I should have liked to hear lectures on geography but the equipment of the University was extremely unsatisfactory. I tried to attend a course on German geography by Müller, but I found his lectures insufferably tedious, without any apparatus for purposes of demonstration—nothing but a bare enumeration of names. Nor were those

⁷ *Addresses at the Inauguration of Daniel C. Gilman as President of the Johns Hopkins University* (Baltimore: John Murphy and Co., 1876), pp. 38ff.

of Kiepert, the learned historical geographer and designer of admirable maps, on a higher level. . . .

Generally speaking the equipment and program of the University left much to be desired. There were no lectures on history of modern art, nor even modern German literature—with the exception of a course of lectures on *Faust*. The other modern languages and literatures were no better off; it was not until the later 1870's that chairs began to be established for them. In those early days they were considered as lying outside the limits of strictly scientific work, Greek and Roman literature being alone regarded as amenable to scientific treatment and worthy of it.⁸

This description of higher education in the largest and most progressive of the German universities of that day adds significance to the pioneering viewpoint in the American institutions. It is important to note that expansion into new fields took place as a parallel movement in the two countries. This was likewise true at Oxford and Cambridge where modernization of the program and instruction did not begin until 1877, following reports from two reform commissions.

Some of the resulting problems

The vision of the great university leaders was of course not instantly or perhaps ever completely realized. Actual programs had to be developed in keeping with public sentiment and with what the available faculty could conceive and implement in terms of the capacities and backgrounds of students who enrolled. Too often a wide gulf separated these rudimentary, partial, immediately feasible projects from the bold and comprehensive reforms envisioned by the Eliots and the Gilmans. Many of the difficulties inhered in the fact that most graduate schools were offshoots of earlier foundations, in which the college of liberal arts constituted the most important element. This distinctly American conception of a graduate school as an integral part of a total university repudiated the Johns Hopkins and Clark adaptations of the continental plan of university organization. This circumstance in no way lessens our indebtedness to

⁸ Friedrich Paulsen, *An Autobiography* (New York: Columbia University Press, 1938), pp. 214-15.

the latter institutions as seedbeds for maturing graduate practice and for producing the initial supply of graduate professors.

Whatever its causes, there has followed in the wake of this accident of educational history a group of problems and issues related to the financing and administration of graduate schools, to their curricula, to faculty and student personnel matters, and to the issues of academic freedom. In most universities the graduate school has only an office budget and the dean has little control over departmental budgets or the selection of staff members. Such matters are customarily determined by undergraduate considerations. The graduate dean and other general university officers usually have had much less authority than their undergraduate counterparts in shaping their respective courses of study. This departmental independence, if not autonomy, has made for a remarkable unevenness of quality in doctoral work in a given institution. In universities consisting of a complex organization of schools and colleges, especially in the period before 1900, it was especially difficult to secure graduate faculty members and to maintain an environment favorable to freedom for learning, teaching, research, and publication. Departments had to raise the standard of their undergraduate staffs, "raid" the staffs of other graduate schools, or import graduate professors trained in England or on the Continent. The pulling and tugging of these issues on a university president is well illustrated by a few sentences from the following sketch of William Rainey Harper of the University of Chicago:

He had to mediate and compromise between a divinity school and a [graduate] faculty to whose members he had promised entire academic freedom, and the spokesmen of an alarmed sectarian orthodoxy; between the requirements of an ideal for the University that constantly outran its budget, and the practical business sense of trustees and founders for whom living within an income was the first test of sound administration; between a public for whom a college was a school, and a band of scholars whose hearts were set upon research; between the promoters of immediate expansion into professional schools of every kind, with whom his own impatience

sympathized, and the cautious advocates of consolidation within departments already established.⁹

The accepted pattern of graduate school organization permitted strong undergraduate departments in the better established fields of knowledge to undertake graduate work long before the newer fields, such as geography, economics, and meteorology, had developed substantial undergraduate work. Indeed, this arrangement forced many of the newer fields into work at the graduate level before they had the staff or equipment for it. The kinship of modern languages and literature with their classical counterparts enabled them to clear this hurdle more quickly than was possible for the social and natural sciences. As one would expect, older departments like those of classical languages and literature, philosophy, and mathematics tended to follow the abstruse and often pedantic systems of scholarship established in the medieval and the humanistic periods, rather than a pattern centered on application to contemporary life such as was advocated from the days of Franklin and Jefferson and generously emphasized by outstanding leaders during the last quarter of the nineteenth century. Down to our own day the major emphases and practices in graduate work have come more from the strength of existing liberal arts faculties than from the combined pronouncements of Gilman, White, Eliot, Angell, Hall, Harper, and the other pioneers.¹⁰

An examination of university catalogs shows that graduate instruction in the leading universities between 1875 and 1900 was in the hands of staff members, a majority of whom did not

⁹ *Dictionary of American Biography* (New York: Charles Scribner and Sons, 1928-36), Vol. VIII, pp. 289-90.

¹⁰ This generalization is illustrated by the practices of Herbert Baxter Adams. With a Ph.D. from Heidelberg, he early started graduate instruction in American history at Johns Hopkins—and at other leading universities through the thirty-eight students he had graduated by 1892—into the narrowly conceived channel of “institutional history” then so popular in Germany. The titles of both the courses and the early dissertations emphasize his preoccupation with *Verfassungsgeschichte*. Legend has it that when thesis topics began to meet the law of diminishing returns, Adams advised his students to turn from American to European history, and that the youthful Frederick Jackson Turner took such patriotic umbrage at this attitude that he went forth to initiate the epoch-making studies of the frontier which marked the beginning of the successful broadening of the study of American history.

have the Ph.D. degree or other evidence that they themselves had undergone the discipline of the regimen they were conducting. A strong department was fortunate if it had more than one professor with an earned doctorate and who was experienced in and zealous for the German ideals of university teaching and research. A "minor" department, that gave supporting graduate courses but did not itself prepare candidates for the Ph.D. degree, seldom had such leaders; it tended to give its graduate offerings in the fashion used for undergraduates and indeed—as is still quite common—to do no more than admit graduate students to advanced courses for undergraduates. The scarcity of outstanding scholars and of funds to employ available ones on a permanent basis caused many of the first-rate universities, Johns Hopkins and Chicago leading the list, to strengthen their graduate departments through the use of distinguished visiting lecturers who gave instruction in their specialties after the fashion of German university professors.

Johns Hopkins and Chicago also led the other universities in subsidizing or otherwise stimulating publication of the scholarly findings of professors and their advanced students either as monographs or as articles in scholarly journals issued by their university presses. This innovation heightened the desire of professors and students to do research that would be enough of a contribution to existing knowledge to be worthy of publication. In turn, this led to a greatly increased use of seminars, which Hall apparently was the first to christen "graduate workshops," and to the use of what he called "elbow teaching" in guiding laboratory experimentation and the reading associated with it or with the fashioning of thesis research in a seminar. The professors frequently outnumbered the students in such seminars. The small number of advanced students prior to 1900 made it feasible to conduct graduate work on an apprenticeship basis; indeed, most of the students were paid assistants of one kind or another.

The fact that few of even the better universities were able to offer a wholly adequate graduate program in any given field led students to imitate the migration then common in German

universities. Institutions of higher learning tended to frown upon this practice and, in turn, to redouble their efforts at improvements calculated to attract superior students and hold them through the full period of their graduate study. A handbook of the affiliated clubs of graduate students, a voluntary organization of graduate alumni with chapters throughout the nation, states the case succinctly from the students' point of view:

The scope of the course at one university is limited by the knowledge and special interests of the instructors there. By receiving instruction from several teachers at different places, the student gains breadth of view which is his best preparation for research. On the other hand the teachers gain new ideas and new inspiration from contact with students trained elsewhere.¹¹

Naturally educational leaders were more impressed with the compensating advantages of long residence at one center and used both degree requirements and financial aid to encourage it. Many of the stipulations as to residence were enacted to control what was considered excessive migration. As President Nicholas Murray Butler of Columbia University explains, fellowships and scholarships were not new ideas in American higher education but Johns Hopkins put them on a different basis by opening them to the competition of all qualified students, and by making the stipend larger than anything then known. He considered the fellowship program at Johns Hopkins one of the outstanding innovations in early graduate education:

Perhaps Mr. Gilman's most striking innovation was the foundation of twenty annual fellowships of a value of \$500 each, open to the graduates of any college. The principle was not new; but in America, at all events, it was the custom to restrict appointments to fellowships, where they existed, to graduates of the college supporting them. Mr. Gilman, on the other hand, threw open the Johns Hopkins fellowships to general competition; and it was this step as much as any other single one, which fixed the relation of the new university to the colleges of the country and which attracted to it at once the most promising of the younger scholars.¹²

¹¹ *A Handbook for Graduate Students* (Boston: Ginn and Co., 1894), p. 12.

¹² Nicholas Murray Butler, "President Gilman's Administration at The Johns Hopkins University," *Review of Reviews*, XXIII (January 1901), 54.

The most important aspect of the new era in American graduate education inaugurated with the founding of Johns Hopkins University is thus seen to have been its practical orientation to what were considered the fundamental problems of contemporary society. The organization of departments for the newer fields of learning resulting from this drive paralleled rather than imitated similar developments in England and the rest of Europe. The chief administrative difficulties with which American educators were confronted in this connection resulted from the prevailing pattern of university organization which gave pride of place financially and otherwise to the undergraduate college of liberal arts. Until the turn of the century it was difficult to secure able graduate professors in sufficient numbers to hold superior students for the full period of their graduate study in a single institution.

THE ERA OF STANDARDIZATION, 1900 TO 1918

By 1900 twenty of the fifty institutions conferring the earned degree of doctor of philosophy were passing from the pioneering stage to that of concern for advancing and protecting the practices they had evolved independently though after informed consultation with each other. As a matter of fact, much of the pressure for uniform requirements for the degree came from organizations of former students and from other outside groups. This trend was of course part of the larger movement to which the foundations and accrediting associations devoted themselves during this period, toward standardizing and delimiting the scope respectively of the high school, the college, and the graduate school.

A list of the problems before the better institutions at the turn of the century is reminiscent of those we face in 1945. Each university required its own bachelor's degree or the equivalent for admission to graduate study; but there was at the time such disparity among undergraduate degrees as to make the "equivalent" mean whatever those responsible for graduate admissions in a particular school wished to approve. The residence requirement, another way of describing restrictions on student migration, varied by half-years from one to two full

years. In some cases this requirement was accepted simply as the first period of graduate work. The whole time normally required for earning the Ph.D. degree ranged from two to three years; certain universities required this longer period only if some of the work was done away from the campus. The twenty institutions differed considerably with regard to requiring foreign languages: eight of them did not insist on any foreign language; another eight demanded French and German; three specified French, German, and Latin; and the remaining university required Latin only. Conceptions of an acceptable dissertation ranged within as well as among institutions, as they do today, from a brief essay to be typed and filed in the library to an original contribution that had to be printed. Fourteen of these universities required publication in some form. In certain among them there were no preliminary examinations for candidacy and the final examination was an oral quiz on the dissertation; others required written and oral examinations on the major and minor areas of study, both preliminary and final, in addition to defense against searching criticism of the findings and methods.

Toward the end of the pioneering period three outside groups, in the absence of any legal coordinating body, urged the universities to undertake a voluntary cooperative plan for standardizing degree requirements. But it was well within the twentieth century before their recommendations were incorporated into practice. In 1893 and again in 1896 the Federation of Graduate Clubs addressed resolutions to the governing boards of American universities urging the universal use of the maximum practice described in the preceding paragraph, except that there was no mention of foreign languages. Two other minor recommendations of the Federation are now widely followed, namely that the dissertation bear the written acceptance of the major professor and be accompanied by a brief biography of the candidate. The university senate of the Methodist Episcopal Church, speaking with authority to its affiliated institutions and as a recommendation to other universities, adopted a resolution in 1893 supporting the general use of the above maxi-

imum practice. It urged in addition that the bachelor's degree for graduate admission be based on at least three years of high school work and that time spent in professional schools should not be credited to the period required for the Ph.D. degree. In the same year the International Congress on Education, meeting at the Columbian Exposition on the present site of the University of Chicago, recommended that a committee consisting of the presidents of Johns Hopkins, Yale, Columbia, Princeton, Chicago, and California should determine and publish a list of universities, which might be extended or restricted from year to year, that it considered qualified to confer the Ph.D. as an earned degree. Seven years later this idea came to expression when fourteen of the country's leading universities organized themselves as the Association of American Universities.

The influence of professional organizations

Since the early 1900's four professional organizations have worked more or less independently to advance or stabilize requirements for the Ph.D. degree among their member institutions; these are the Association of American Universities just mentioned, the National Association of State Universities, the Association of Land-Grant Colleges and Universities, and the American Association of University Professors. During the same period the philanthropic foundations, particularly the Carnegie and Rockefeller groups, and the regional accrediting associations have had a profound indirect influence on graduate education through their interest in increasing the number of doctors of philosophy on the staffs of undergraduate colleges.

The fourteen universities that came together in 1900 as the Association of American Universities were motivated by the wish to confer annually about developing among themselves uniform conditions under which students might become candidates for higher degrees, about raising "the standards of our own weaker institutions," and—to borrow a term from organized labor—about acting as the sole bargaining agent for American students seeking admission to, or advanced standing

in, foreign universities.¹³ The Association was quite generally recognized for the latter purpose by 1905; most institutions abroad followed the University of Berlin's statement on acceptable American colleges, including its declaration that "in order to have work pursued at American universities credited to this faculty . . . the candidate must have taken his work at one of the institutions represented in the Association of American Universities."¹⁴ The exercise of this function made it necessary for the Association to compile and maintain a list of colleges whose bachelor degrees were acceptable for admission to graduate work at home or abroad, an activity that in time led to semiaccreditation. The Association's statement of policy declared that European universities were to be discouraged from conferring the degree of doctor of philosophy on American students who were not prepared to take the degree from our own best universities, and from granting degrees to American students on lower terms than to their native students.¹⁵

Prior to the compilation of its own list of approved colleges in 1913, the Association of American Universities certified to foreign universities its own membership and the colleges which were approved by the Carnegie Foundation for pension purposes, or which met all of this foundation's standards except that of being free of sectarian control. At the urgent request of the Association, the United States Office (at the time called Bureau) of Education classified 344 colleges in terms of their fitness to prepare for graduate work; but there were so many protests that the list was withdrawn at the direction of the President of the United States.

¹³ The fourteen member institutions were California, Catholic University of America, Chicago, Clark, Columbia, Cornell, Harvard, Johns Hopkins, Michigan, Pennsylvania, Princeton, Stanford, Wisconsin, and Yale. By 1918 ten others had been added: Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, Northwestern, Ohio State, and Virginia. Since 1918 the total membership has risen to thirty-four through the addition of Brown, California Institute of Technology, Duke, McGill, Massachusetts Institute of Technology, North Carolina, Rochester, Texas, Toronto, and Washington University.

¹⁴ *Graduate Handbook, 1893-94* (Boston: Ginn and Co., 1894), p. 13.

¹⁵ *American Association of Universities: Proceedings and Addresses of First and Second Annual Meeting, 1900-1901*, p. 15. See also *Graduate Handbook No. 7, 1899* (Philadelphia: J. B. Lippincott Co. for the Federation of Graduate Clubs) p. 11.

During this period member institutions also admitted applicants for graduate work from outside the Carnegie list and for this purpose each university maintained its own private list of approved colleges. The experience of the University of Chicago is probably representative. In judging the equivalence of "other institutions of good standing" Chicago at first insisted on requirements for the bachelor's degree that were identical with its own. Beginning in 1903, however, it accepted without such a requirement the degrees of an unspecified list of approved colleges. By 1917 this list had grown to 289 institutions and in 1918 it was classified into three groupings: institutions whose degrees were accepted for admission without qualification, those accepted subject to any penalties indicated by an examination of the student's college record, and those requiring examination of both the college and the high school record. The Association's 290 approved colleges, some of whose graduate departments also give the Ph.D. degree, today constitute Chicago's priority list, but actually these institutions enjoy little advantage over colleges accredited by the regional associations.¹⁶ Perhaps the list of colleges most universally used for admission purposes is the one prepared by the American Association of Collegiate Registrars. Today practically all admission is by transcript of undergraduate work, supplemented by the opinion of the candidate's undergraduate teachers, and occasionally by the Carnegie Foundation's graduate record examination. This change in admissions procedure and the fact that not many American students go to foreign universities for advanced degrees has limited what was an important channel of Association influence.

The Association of American Universities has never looked with favor on the suggestion that it determine and publish a list of universities qualified to give the Ph.D. degree. It has been content to develop qualitative and quantitative standards which by consensus its members have followed and which it has hoped that nonmembers giving the degree would imitate. It has sought to maintain the Ph.D. degree on a high academic plane and this

¹⁶ For documentation see Marcia Edwards, *Studies in American Graduate Education* (New York: Carnegie Foundation for the Advancement of Teaching, 1944).

singleness of purpose has perhaps reduced its sensitivity to cultural developments that call for modification if the degree is to retain its social usefulness for a majority of the persons to whom it is awarded.

Within their orbits of influence the National Association of State Universities and the Association of Land-Grant Colleges and Universities, through their graduate divisions, have from time to time sought ends similar to those pursued by the slightly older organization. Their affiliated institutions have been by nature and situation less traditional and more responsive to contemporary needs, especially in the practical or vocational fields. Where precedents in the older fields did not apply these institutions, working in uncharted areas, have had little by which to gauge their activities. The superior institutions in each association that had not been invited to membership in the Association of American Universities were nevertheless certain of their mandate to undertake doctoral work in areas of their major interest, and they had no doubt of their qualifications to do so. Because membership in these associations was not based primarily on capacity to offer graduate study, the stronger institutions were not in a position to pass on the qualifications in this respect of their weaker associates. This situation has not, however, kept the two organizations from working to maintain character and quality in graduate education. They have likewise operated to secure a high level of ability, training, and productivity in the staff; to apportion teaching loads so as to allow time for directing graduate students and for conducting individual research; to provide adequate physical facilities and administrative arrangements sufficient to the needs of students and staff members; to protect the graduate character of advanced course offerings; and, most important of all, to secure candidates of genuine Ph.D. caliber.

The American Association of University Professors is the fourth of the historically important professional agencies for shaping standards to govern the Ph.D. degree. It provides for the rank-and-file professor a medium for studying the problems of graduate schools comparable to that open to deans and presi-

dents in the three associations already discussed. In 1915 this organization appointed a special committee to make recommendations on criteria for awarding the doctor's degree; three years later the committee made a comprehensive report which appeared in the Association's *Bulletin* for January-February 1919. The significance of this document lies not in any novel proposal but in the completeness with which it presents professional opinion at the close of the first world war on standards for the Ph.D. degree.

The influence of philanthropic foundations

All of the standardizing efforts made between 1900 and 1918 proceeded on the assumption that the purpose of the degree program was to train individuals who would either devote themselves to research directly, or who would combine individual study of an advanced character with the training of other research workers under university auspices. The assumption had been sound until around 1905 when a new and powerful combination of forces began to shunt recipients of the degree away from specialized university work into undergraduate college teaching and counseling in broad generalized fields of knowledge. In order to be sure that they were pensioning college professors and making grants to *bona fide* colleges rather than to secondary schools, the philanthropic foundations—especially the General Education Board and the Carnegie Foundation for the Advancement of Teaching—began to require, among other standards, that institutions employ six (later eight) professors who held an earned doctor's degree. This foundation stimulus, added to the pressure from regional accrediting associations for larger and larger proportions of doctors of philosophy on undergraduate faculties, created an immense new market for advanced students. These agencies had no immediate or direct interest in standards for the Ph.D. degree but they so completely changed the occupational outlet of a majority of its recipients that it became incongruous to expect the degree to retain its social utility if administered in terms of the original purpose.

Graduate school officials responded in two diametrically opposed ways to the changed situation. First, they admitted a less homogeneous group of students and expanded their facilities to supply scholarly personnel for diverse occupations, including professors with doctor's degrees for the many colleges that were seeking to become accredited or to maintain such a status. But at the same time they proceeded with the standardization of degree requirements as if their purposes had remained unchanged from the days of Daniel C. Gilman. This disregard of the basic assumption that the social purpose of a degree constitutes the framework in which its content and standards should be developed led inevitably to the practice, frequently described in current professional periodicals, of observing the letter of requirements—in languages, thesis, and examination, for example—while winking at the spirit of these standards.

It will be seen accordingly that two major streams of influence were brought to bear on American graduate practice after the stages of pioneering had run their course. In the first place, professional interests came together to consolidate gains and standardize procedure. And secondly, philanthropic foundations combined with accrediting associations to raise the standards of the profession itself. In so doing they not only enormously increased the market for holders of the Ph.D. degree but also set in motion forces that changed the function and social purpose of the degree. The significance of this entirely unpremeditated consequence of their efforts will receive further attention in the discussion to follow.

EXPANSION AND CHANGING PURPOSE, 1918 TO 1945

The first world war gave impetus to the forces that were changing higher education in the United States, and added components that in confluence with them inundated "the landmarks which the fathers set" at the beginning of the century. A review of the nature and direction of this impact should add to the perspective needed for solving some of the current problems connected with the Ph.D. degree. In performing such an exercise, however, the assumption must be avoided that the ex-

perience of the past necessarily holds the clue to all contingencies that may arise after the close of the second world war. Social forces now barely discernible may well induce further change that could turn out to be just as significant and just as unpredictable as the redirection that resulted from the efforts of the philanthropic foundations and the accrediting associations after 1900.

During the interwar years at least three powerful constellations of mutually related societal pressures combined to alter the nature and conditions of university work at the graduate level. First, there were the factors associated with the phenomenal increase at this time in the size and diversity of the graduate student population. A second series of factors modified the methodology of productive research and transferred major responsibility for conducting it from the universities to governmental, endowed, and commercial agencies. And in the third place, there were factors basic to the struggle between public and private enterprise for control of the outcomes—and hence the means—of research. The effect of these complex forces on objectives, subject matter, and procedure in graduate education during the last twenty years has not been generally acknowledged by the profession, indeed it has not always been recognized. Perhaps we have felt it would be heresy to admit that vital changes have taken place in the inner nature of a program to the external orthodoxy of which we have steadfastly subscribed. At any rate, it is hoped that brief discussion of the three interacting groups of factors will contribute to a realistic understanding of the current situation in graduate schools, and be a means to the insight needed for taking the next steps forward.

The altered population of graduate students

What the deluge of enrollment following the war of 1914-1918 did to graduate practice was due in undetermined proportions to its volume, to its diversity, and to the attitude of orthodox leaders toward it. These factors will be examined in sequence. As reported to the United States commissioner of edu-

cation, the total graduate student body in the arts and sciences was 14,406 in 1918 and 54,584 in 1940. During the same period graduate professional enrollment grew from a nominal figure to 51,535. In 1924, only six years after the armistice, these enrollments had doubled and the number of graduate degrees awarded had nearly trebled, having risen from 3,480 to 9,261. Between 1918 and 1924 the number of institutions granting the Ph.D. degree rose from 46 to 62 and the number of degrees conferred from 562 (after dropping to 532 in 1920) to 1,064. In the quarter-century between 1918 and 1941 the number of Ph.D.'s awarded annually rose from 562 to 3,526, an increase of 527 percent. If this phenomenal influx of students had been as homogeneous and characterized by as much ability and singleness of purpose as was true of graduate students before 1918, and if they had been as warmly welcomed by graduate professors as were the earlier groups (both of which conditions were contrary to fact), even then staff and physical facilities would have been unequal to the strain placed upon them by the sheer weight of numbers.

The burden of volume was, however, accompanied by complicated problems inherent in the greater diversity of vocational purpose of these students. New social developments after the first world war made evident the need for scholarly personnel in areas such as human nutrition, home economics, agricultural specializations, social work, public administration, library science, speech, education, psychiatry, geography, meteorology, biochemistry, business administration, and physical education. Colleges, public schools, and public and private nonteaching agencies wanted trained workers in these and other growing fields. In addition they were on the lookout for masters and doctors prepared in the established graduate subjects of the arts and sciences.

The graduate schools faced a dilemma: the desire to expand and serve clashed with the desire to maintain hard-won standards and other evidences of respectability. From the orthodox viewpoint, genuine research could not be the touchstone for determining graduate programs in fields which had neither a

scholarly literature nor a research tradition. Unless a field squared with these criteria responsible administrators were convinced it had no place in the family of graduate departments. And the question of what constituted acceptable fields of graduate work proved to be as inseparable from that of who was competent to give advanced instruction as body is from soul. In the absence of definitive criteria we continue to operate by compromise and gentlemen's agreements. New fields tend to be admitted to graduate standing as their representatives show strength within the academic hierarchy and establish the fact that their Ph.D. degree will serve some important social need voiced by the service area.

The enlarged range of ability and background among both faculty and students, resulting from the increase in numbers, influenced the nature of graduate education in the period between the two world wars more than did the admittedly significant diversity in fields of interest. As long as our graduate schools enrolled less than 500 students it was plausible to assume that selective factors had somehow brought to this work only creative and otherwise superior minds, and that a regimen centered on independent original research was suited to their and the nation's needs. But when the numbers enrolled approached 55,000 such assumptions became preposterous, and the leading graduate schools lost face with intellectual realists by holding to postulates that no longer applied.

University leaders who are concerned with preparing graduate students for the work society has for them to do more than with upholding traditional ideas of graduate study, have consistently declared that much educational effort has been wasted through failure to recognize the mental limitations of faculty and students and through disregarding their special aptitudes and ambitions. These critics have insisted with some success that the graduate school Procrustes should adjust his bed of requirements to fit the needs of scholarly occupational groups and individuals rather than continue to force them into inflexible dimensions. Such persons have opposed the negative attitude, passive resistance, and stop-gap measures adopted by

our dominant graduate schools in the face of the raging flood of social pressure that has been sketched.

Nevertheless, many orthodox graduate schools have continued to insist that the higher degrees be reserved only for scholars interested in the great task of extending the boundaries of knowledge. They have tried to protect their conception of the M.A. and Ph.D. degrees by shunting the horde of public school teachers and other admittedly nonresearch students into work for differently designated degrees. And they have often shifted responsibility for the award of the new degrees to some other school of the university. They do not yet publicly acknowledge that the bachelor's degree has lost its meaning as the basis for admission to graduate work and the master's degree its significance as a proving ground for doctoral candidates. Despite the fact that doctoral study now covers areas as diverse as physics and physical education or history and home economics, there is still a tendency to maintain that the graduate school is a unitary institution and that a single procedure may be used to transform advanced students of all types into competent research workers. When the situation is officially recognized for what it is, then most of the present artificial barriers to scholarly but practical programs of study may disappear—especially those related to course work, the tools of research, and the nature of the dissertation. Operation as a multiple-purpose institution does not in itself imply any lowering of standards.

The rise of nonacademic agencies for research

The second group of factors mentioned earlier as having altered the conditions surrounding graduate study since 1918 are connected with the transfer of primary responsibility for productive research from the universities to other agencies. This shift, with its accompanying change of methodology from independent to cooperative work, has influenced policies governing the Ph.D. degree less directly but no less significantly than did the number of students and diversity of fields of study.

Before 1918 the universities were primary agencies for organized research in the United States. They were so important

at the beginning of the first world war that President Woodrow Wilson authorized organization of the National Research Council to mobilize their strategic facilities for winning the war. At that time there were fewer than 300 private laboratories for industrial research in the country; and these were small and devoted largely to routine testing and developments rather than to basic research in their fields. There were no endowed research organizations to speak of aside from the Carnegie Institution of Washington and the Rockefeller Institute for Medical Research. The federal government was not then spending more than \$6,500,000 annually for research, most of which was going to the War and Navy Departments and to the land-grant colleges. Universities were clearly the leaders in fundamental research and this fact was an important determiner of graduate school policies.

When the second world war broke out the universities had become relatively less important in productive research, both because our economy had moved into a new era and because the same social forces that brought this about had driven the graduate school in the direction of becoming an unspecialized professional school for scholarly workers in general. By 1941 the country had 2,264 industrial research laboratories that employed over 44,900 full-time workers, three-fifths of whom were trained in research, as compared with 1,000 collegiate institutions that by the most generous estimates employed 10,000 persons who gave only a fraction of their time to research. As a matter of fact practically all university research was conducted in some 300 institutions by approximately 3,000 professors who on the average devoted one-fourth of their time to it. The striking development of research bodies outside the universities is further illustrated by the annual budget of \$50,000,000 currently set aside for research by the chemical industries; according to data furnished by the National Resources Planning Board this figure by itself equaled the amount spent in 1939-40 by the universities for all research purposes.

This development does not diminish the importance of conducting mature research in institutions of higher learning. All

applied research depends on the quality and savor of the basic variety. The fact that university research now makes no more than a minor contribution to the increasing mass of essential findings simply indicates that our economy has reached a stage of development that calls for greater differentiation of functions. As the situation immediately ahead looks now, faculty members in graduate schools will probably be called on to devote more time and talent to preparing others for research and related scholarly activities than to productive research themselves. Life in government and industry has become too complex and too dependent on research to make it possible to leave so vital a function to the off hours of university professors and the amateur work of their advanced students. On the other hand, much of the research required for protecting the public welfare and advancing private enterprise is of a routine nature that would tend to exploit rather than educate the graduate student. State universities and land-grant colleges charged by law with testing and standardizing activities of the type suggested have learned that they can make very little use of such programs for training research personnel. It is of course true that research workers can be developed only where research is in progress, but the study should be graduated to the candidate's needs and this is usually not feasible in a production situation.

This differentiation of function has provided graduate schools with richer opportunities for improving the education of personnel for the several scholarly needs of government, industry, and the collegiate institutions. Employers of Ph.D. recipients concur in the opinion, to be elaborated in a later chapter, that the years of graduate study should be devoted largely to the *education* as distinguished from the *training* of candidates. That is to say, they would like to see these years given to the study of fundamental principles in a given broad field, or in related smaller fields, rather than to acquiring specialized techniques that change from year to year and that can be learned most effectively on the job. They would prefer to see the candidate's thesis research demonstrate initiative, intellectual maturity, and grasp of the investigational procedures used rather than to have

it exemplify what the academicians call an "independent and genuine contribution to knowledge." And, while the idea is frowned upon by many graduate faculty members, these employers would like more attention given to the selection and development of candidates as human personalities. It is their opinion that thinking has so much physiology and sociology in it that we cannot judge a person's mind without considering his whole being. They insist that ability to work cooperatively with fellow staff members and to develop normal sensitivity to social and community responsibilities is as essential to success as technical competence.

The struggle for control of research

The third set of social forces now shaping graduate education is associated with the growing contest between government and private enterprise for the control of research. Each party has come to see in research a national asset of greater ultimate value than the natural resources it is currently developing. The issue is clear: power over the means of scientific research and technological progress offers the surest of all ways of regulating modern business—especially big business whose monopoly or competitive status depends on trade secrets, patents, and cartels. Since the graduate school is the primary agency through which research workers are trained, it is in the nature of things of interest to both contending parties.

Analysis shows that approximately 90 percent of the 44,900 persons mentioned earlier as being employed in 2,264 commercial research laboratories were concentrated in one-fourth of the establishments. Half of them were at work in forty-five laboratories and one-third of all industrial research workers were employed by the ten largest organizations. Concentration of this magnitude, coupled with cartels or other forms of trade agreement with related foreign industries, has led to growing apprehension among those responsible for public policy over the possibility of misuse of research findings by industry. Large corporations are alleged to be withholding or suppressing data that might promote the public welfare at the expense of private vested interests. It seems evident that the effective promotion of

postwar recovery and reconstruction is in part dependent on the proper control of this source of economic power.

Since the depression years and more especially since Pearl Harbor, government leaders in Congress and the Administration have conducted studies, public investigations, and prosecutions aimed at checking the situation. Among the results of such activities may be cited the three-volume study by the National Resources Planning Board entitled, *Research—A National Asset*; the nine volumes reporting investigations of the Senate committee on patents; the monographs and reports of the Temporary National Economics Committee; the report of the alien-property custodian, *Patents at Work, 1943*; and the three volumes of Senate hearings on "technological mobilization." The item last mentioned covers the hearings on a bill introduced in 1942 by Senator Kilgore "to establish an office of scientific and technical mobilization" to promote research in the national interest.

These activities, combined with the extensive research contracts between the federal government and the universities of the country in recent years, foreshadow a new role in this area for institutions of higher learning. It is not impossible that after this war universities and endowed nonprofit research institutes may be stimulated to expand as rapidly as did industrial and business research after the first world war. Such a probability would be greatly enhanced, of course, if the principles of the Kilgore bill were enacted into law. These principles would make it possible for almost any university division to secure research funds as large as those now available from federal sources to the several specializations of agriculture. If any substantial part of the Kilgore legislation were to be enacted it might, in combination with the so-called "GI Bill of Rights" for veterans, introduce new considerations into graduate study as challenging as any that have hitherto modified the picture.

IN CONCLUSION

The object of this chapter has been twofold. An attempt has been made to show that the vitality of American graduate edu-

cation in the past was the result of practical adjustment to contemporary social needs. In addition, considerations have been presented to demonstrate the fact that social conditions have altered radically in the approximately seventy years that have elapsed since the founding of Johns Hopkins University in 1876. In the next chapter the discussion shifts from the treatment of major forces that have shaped graduate practice to a statistical study of a decade's education and placement of doctors of philosophy. Virtually complete data were received from 94 of the 96 institutions that awarded the Ph.D. degree during the 1930's. This analysis is offered as part of the indispensable background required for initiating sound program change in particular graduate schools.

II

A Decade of Graduate School Experience

GRADUATE FACULTIES engaged in planning improvements for their programs for the doctorate in philosophy have expressed a need for something more tangible than a sense of the force and direction of broad social trends that influence education. From time to time they want to gauge their judgment of proposals by the normative data of their collective experience. Many of them would also like to test the functional adequacy of graduate practice by the opinion of recent graduates and of employers of Ph.D. recipients. But the dearth of both types of material has hindered systematic work along these lines.

Because of the hearty cooperation of officials in 94 of the total of 96 graduate schools that awarded the Ph.D. degree during the 1930's, plus that of doctoral graduates and their employers, it is possible to present in this and the four succeeding chapters a substantial body of normative material that can be used in evaluating existing practice and in devising plans for improving it. This and the next chapter are devoted to an analysis of the education of 22,509 persons still living in September 1940 who received the Ph.D. degree during the period 1930-31 to 1939-40, and of their employment status as of September 1940. The facts are organized to show production and employment trends by institution, by department, by geographical area, and by years of the decade. The employment data show the proportion of the group in the several kinds and levels of teaching, research, and administration in collegiate, precollegiate, and nonteaching agencies.

WHERE THE DEGREES WERE EARNED

Table I shows by institutions and by years of award the source of the Ph.D. personnel with which this study is concerned. Other types of doctorate, including the Ed.D. degree, that commonly appear in tabulations have been eliminated. And since the study is centered on occupational status, deceased holders of the Ph.D. degree have been eliminated. It should be observed that Harvard University and the University of Illinois did not find it feasible to participate in the study. Data from published sources indicate that their inclusion would have swelled totals in this manner: Harvard, 1,371 degrees distributed seriatim from 1930-31 as follows: 134, 135, 140, 148, 132, 155, 138, 129, 107, 153; University of Illinois, 972 Ph.D.'s during the decade distributed as follows: 85, 88, 90, 94, 90, 94, 95, 100, 106, 130. Only two universities exceeded the Harvard total, and only seven universities (including Harvard) exceeded that of Illinois.

It is supposed that each reader will study Table I with an eye focused on his own concerns and needs for data. Among useful generalizations that may be drawn several are of more than local interest. For example, a curve rising with only occasionally broken regularity each year of the decade would describe the rate of increase in the number of Ph.D. graduates being prepared for scholarly careers; this despite the fact that the fluctuation in the number of schools contributing to these annual totals varied from 74 to 87 and in no year included all of the 94 institutions. The latter circumstance is of course due to the existence of easily identifiable new and marginal schools that granted the degree only intermittently.

The marked concentration of centers in which most of the degrees were earned is a phenomenon common to most organized endeavor in the United States but it is the source of many of the problems of securing program adjustments. Many believe the effect of these concentrations on higher education is comparable to that which corporate concentrations of wealth have exerted on commerce and industry. At any rate 50 percent of the Ph.D.'s were conferred by nine institutions with the top

TABLE I

PH.D. DEGREES CONFERRED, 1930-31 TO 1939-40, ON PERSONS STILL LIVING IN SEPTEMBER 1940; BY YEARS OF AWARD AND INSTITUTIONS CONFERRING DEGREE^a

| Institutions (in descending order of Ph.D. output for decade) | Number of Degrees | | | | | | | | | | |
|---|------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Total for Decade | 1930- 31 | 1931- 32 | 1932- 33 | 1933- 34 | 1934- 35 | 1935- 36 | 1936- 37 | 1937- 38 | 1938- 39 | 1939- 40 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| All Institutions | 22,509 | 1,910 | 2,070 | 2,033 | 2,290 | 2,268 | 2,183 | 2,324 | 2,300 | 2,479 | 2,632 |
| Number of Institutions Con- ferring Degree | 94 | 74 | 74 | 75 | 78 | 85 | 83 | 86 | 81 | 87 | 84 |
| Columbia Univ. | 1,851 | 169 | 189 | 186 | 197 | 179 | 186 | 176 | 184 | 190 | 215 |
| Chicago, Univ. of | 1,649 | 160 | 200 | 150 | 160 | 154 | 161 | 167 | 159 | 178 | 160 |
| Wisconsin, Univ. of | 1,328 | 128 | 135 | 125 | 123 | 132 | 108 | 127 | 157 | 140 | 153 |
| Cornell Univ. | 1,271 | 89 | 129 | 146 | 136 | 133 | 123 | 123 | 181 | 181 | 130 |
| Yale Univ. | 1,187 | 94 | 117 | 123 | 118 | 133 | 116 | 134 | 106 | 132 | 114 |
| Michigan, Univ. of | 1,018 | 78 | 94 | 103 | 113 | 95 | 88 | 107 | 111 | 90 | 139 |
| California, Univ. of (Berkeley) | 950 | 79 | 68 | 91 | 107 | 105 | 90 | 98 | 109 | 96 | 107 |
| Ohio State Univ. | 937 | 96 | 86 | 85 | 89 | 86 | 84 | 97 | 81 | 113 | 120 |
| New York Univ. | 850 | 77 | 74 | 90 | 109 | 85 | 8 | 83 | 77 | 73 | 93 |
| Minnesota, Univ. of | 809 | 65 | 70 | 69 | 80 | 84 | 76 | 83 | 82 | 84 | 116 |
| Iowa, State Univ. of | 727 | 78 | 83 | 64 | 63 | 90 | 62 | 82 | 87 | 72 | 46 |
| Pennsylvania, Univ. of | 615 | 76 | 79 | 62 | 59 | 50 | 58 | 53 | 54 | 54 | 70 |
| Johns Hopkins Univ. | 592 | 58 | 79 | 74 | 79 | 50 | 58 | 42 | 58 | 49 | 45 |
| Princeton Univ. | 477 | 51 | 44 | 45 | 37 | 41 | 43 | 54 | 52 | 58 | 57 |
| Iowa State Coll. | 430 | 35 | 33 | 23 | 35 | 33 | 59 | 40 | 44 | 54 | 49 |
| Northwestern Univ. | 409 | 31 | 45 | 33 | 34 | 41 | 37 | 52 | 30 | 45 | 61 |
| Pittsburgh, Univ. of | 401 | 33 | 34 | 37 | 49 | 30 | 31 | 47 | 40 | 51 | 49 |
| Stanford Univ. | 393 | 39 | 38 | 36 | 38 | 41 | 42 | 39 | 23 | 55 | 42 |
| Catholic Univ. of America | 369 | 29 | 31 | 26 | 36 | 29 | 44 | 42 | 42 | 48 | 42 |
| Texas, Univ. of | 276 | 20 | 24 | 17 | 23 | 27 | 21 | 30 | 33 | 40 | 41 |
| Massachusetts Inst. of Tech. | 246 | 8 | 18 | 10 | 23 | 27 | 30 | 29 | 23 | 39 | 39 |
| Washington, Univ. of | 244 | 18 | 20 | 14 | 16 | 28 | 26 | 25 | 29 | 33 | 35 |
| North Carolina, Univ. of | 240 | 18 | 15 | 19 | 16 | 16 | 30 | 27 | 34 | 32 | 33 |
| Duke Univ. | 230 | 9 | 17 | 22 | 22 | 28 | 25 | 24 | 29 | 31 | 23 |
| Pennsylvania State Coll. | 224 | 10 | 15 | 12 | 24 | 19 | 18 | 27 | 25 | 25 | 49 |
| George Peabody Coll. | 211 | 14 | 21 | 22 | 27 | 11 | 21 | 22 | 20 | 23 | 30 |
| Fordham Univ. | 207 | 30 | 14 | 14 | 29 | 20 | 17 | 16 | 23 | 21 | 23 |
| Virginia, Univ. of | 196 | 14 | 13 | 13 | 21 | 23 | 22 | 20 | 21 | 25 | 24 |
| Nebraska, Univ. of | 194 | 17 | 17 | 8 | 19 | 24 | 16 | 24 | 19 | 13 | 37 |
| South'n Calif., Univ. of | 192 | 11 | 9 | 13 | 16 | 20 | 25 | 23 | 23 | 27 | 25 |
| Missouri, Univ. of | 187 | 19 | 15 | 11 | 18 | 24 | 22 | 20 | 20 | 12 | 26 |
| California Inst. of Tech. | 185 | 37 | 15 | 26 | 15 | 11 | 17 | 20 | 15 | 19 | 10 |
| Brown Univ. | 164 | 9 | 16 | 14 | 20 | 15 | 25 | 17 | 14 | 15 | 19 |
| Indiana Univ. | 153 | 4 | 10 | 16 | 17 | 11 | 10 | 20 | 21 | 19 | 25 |
| Western Reserve Univ. | 153 | 11 | 8 | 11 | 11 | 15 | 17 | 18 | 13 | 24 | 25 |
| Maryland, Univ. of | 147 | 12 | 8 | 10 | 14 | 21 | 20 | 16 | 17 | 16 | 18 |
| Cincinnati, Univ. of | 143 | 13 | 13 | 11 | 13 | 14 | 13 | 10 | 10 | 23 | 13 |
| Purdue Univ. | 137 | 5 | 2 | 8 | 10 | 16 | 22 | 20 | 12 | 14 | 23 |
| South'n Baptist Theol. Sem. | 127 | 16 | 17 | 14 | 21 | 13 | 11 | 10 | 12 | 10 | 3 |
| Radcliffe Coll. | 123 | 8 | 15 | 14 | 11 | 13 | 13 | 12 | 14 | 12 | 11 |
| Kansas, Univ. of | 120 | 8 | 10 | 14 | 18 | 17 | 8 | 11 | 11 | 8 | 15 |
| Rochester, Univ. of | 116 | 5 | 5 | 5 | 5 | 11 | 14 | 11 | 20 | 15 | 25 |
| Boston Univ. | 113 | 8 | 9 | 5 | 7 | 7 | 9 | 11 | 16 | 24 | 17 |
| St. Louis Univ. | 110 | 13 | 11 | 8 | 12 | 12 | 8 | 14 | 15 | 10 | 7 |
| Washington Univ. (St. Louis) | 109 | 9 | 11 | 12 | 8 | 13 | 11 | 13 | 12 | 16 | 4 |

^a This, like the other tables in this volume, includes data for all American graduate schools that conferred the Ph.D. degree during the period covered excepting only Harvard University and the University of Illinois from which reports were not received. Figures for these two institutions, obtained from published sources and without adjustments for death of recipients prior to September 1940, are reported in the text, p. 39.

TABLE I—Continued

| Institutions (in descending order of Ph.D. output for decade) | Number of Degrees | | | | | | | | | | |
|---|------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Total for Decade | 1930- 31 | 1931- 32 | 1932- 33 | 1933- 34 | 1934- 35 | 1935- 36 | 1936- 37 | 1937- 38 | 1938- 39 | 1939- 40 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Colorado, Univ. of | 107 | 8 | 8 | 9 | 5 | 20 | 14 | 10 | 12 | 9 | 17 |
| Bryn Mawr Coll. | 95 | 4 | 9 | 8 | 11 | 18 | 8 | 16 | 9 | 10 | 12 |
| Rutgers Univ. | 93 | 5 | 9 | 3 | 11 | 8 | 11 | 9 | 10 | 17 | 10 |
| Vanderbilt Univ. | 89 | 6 | 7 | 11 | 7 | 4 | 10 | 12 | 9 | 14 | 9 |
| Michigan State Coll. | 84 | 8 | 4 | 9 | 6 | 15 | 8 | 13 | 2 | 8 | 11 |
| Clark Univ. | 84 | 5 | 4 | 11 | 10 | 12 | 8 | 9 | 9 | 10 | 6 |
| American Univ. | 73 | 13 | 10 | 12 | 9 | 7 | 6 | 5 | 4 | 8 | 4 |
| Louisiana State Univ. | 66 | — | — | — | — | 3 | 6 | 13 | 9 | 15 | 20 |
| Notre Dame, Univ. of | 60 | 2 | 2 | 8 | 5 | 8 | 6 | 8 | 7 | 13 | 6 |
| Boston Coll. | 58 | 5 | 2 | 7 | 8 | 5 | 7 | 5 | 10 | 7 | 2 |
| Syracuse Univ. | 57 | 3 | 3 | 4 | 3 | 6 | 6 | 5 | 15 | 11 | 1 |
| Hartford Sem. Foundation | 48 | 6 | 3 | 5 | 8 | 4 | 6 | 4 | 6 | 3 | 5 |
| Kentucky, Univ. of | 48 | 2 | 2 | 6 | 5 | 2 | 1 | 7 | 12 | 4 | 7 |
| Georgetown Univ. | 47 | 8 | 4 | 4 | 5 | 5 | 5 | 1 | — | 6 | 9 |
| Lawrence Coll. (Inst. of Paper Chem.) | 45 | — | — | 4 | 5 | 1 | 3 | 6 | 5 | 8 | 13 |
| George Washington Univ. | 42 | — | — | — | 12 | 9 | 5 | 3 | 6 | 6 | 1 |
| Massachusetts State Coll. | 40 | 4 | — | 1 | 6 | 5 | 5 | 2 | 3 | 5 | 12 |
| Rice Inst. | 40 | 5 | 2 | 4 | 5 | 7 | 2 | 3 | 1 | 5 | 6 |
| West Virginia Univ. | 39 | — | 7 | 3 | 3 | 9 | 4 | 2 | 2 | 3 | 4 |
| Drew Univ. | 33 | 3 | 2 | 5 | 4 | 4 | 4 | — | 3 | 2 | 3 |
| Colorado State Coll. of Ed. | 30 | — | — | — | 4 | 1 | 3 | 2 | 5 | 8 | 7 |
| Oklahoma, Univ. of | 29 | — | — | 4 | — | 7 | — | 6 | — | 7 | 3 |
| Florida, Univ. of | 28 | — | — | — | 3 | 7 | 2 | 5 | 5 | 2 | 4 |
| Carnegie Inst. of Tech. | 27 | — | 2 | 1 | 1 | 6 | 3 | 2 | 6 | 3 | 3 |
| Washington, State Coll. of | 27 | 3 | 1 | 1 | 5 | 3 | 2 | 1 | 2 | 7 | 2 |
| Union Theol. Seminary | 26 | 3 | 2 | — | 3 | — | 3 | 2 | 4 | 5 | 4 |
| Marquette Univ. | 26 | 4 | 1 | 1 | 2 | — | 2 | 2 | 6 | 2 | 6 |
| Niagara Univ. | 25 | — | — | — | 3 | 3 | 4 | 6 | 7 | 1 | 1 |
| Dropsie Coll. | 22 | 3 | 1 | — | 3 | 5 | 1 | 4 | 2 | 2 | 1 |
| Rensselaer Polytechnic Inst. | 22 | 1 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 |
| Oregon, Univ. of | 20 | 2 | 5 | 4 | 2 | 2 | 2 | — | 2 | 1 | — |
| Oregon State Coll. | 18 | — | — | — | — | 4 | 1 | 1 | 5 | 3 | 4 |
| Brookings Inst. | 18 | 13 | 1 | 1 | — | — | 3 | — | — | — | — |
| Arizona, Univ. of | 16 | 1 | — | 2 | 3 | 2 | 1 | 1 | 3 | 1 | 2 |
| North Dakota, Univ. of | 16 | 3 | 1 | — | 6 | 4 | — | 1 | — | 1 | — |
| Tulane Univ. | 15 | — | 1 | 1 | 4 | 2 | 1 | 2 | — | 1 | 3 |
| Brooklyn, Polytechnic Inst. of | 15 | — | — | — | — | 1 | 1 | 6 | 1 | 2 | 4 |
| N. Y. State Coll. of Forestry (Syracuse Univ.) | 13 | 1 | — | 1 | — | 1 | 5 | 1 | 1 | 2 | 1 |
| Buffalo, Univ. of | 12 | — | — | — | — | 4 | 2 | 1 | 3 | — | 2 |
| Loyola Univ. (Chicago) | 12 | 1 | — | — | — | 1 | 1 | 2 | — | 2 | 5 |
| Kansas State Coll. | 7 | — | — | 1 | — | 1 | — | 1 | 2 | 2 | — |
| South Carolina, Univ. of | 6 | 1 | 2 | 1 | — | 1 | — | 1 | — | — | — |
| California, Univ. of (Los Angeles) | 5 | — | — | — | — | — | — | — | 1 | 4 | — |
| Duquesne Univ. | 5 | 1 | 2 | — | — | 1 | — | — | — | 1 | — |
| St. John's Univ. (Brooklyn) | 3 | — | — | — | — | — | — | — | — | 2 | 1 |
| Tennessee, Univ. of | 3 | — | 1 | — | — | — | — | 2 | — | — | — |
| Smith Coll. | 2 | — | — | — | 2 | — | — | — | — | — | — |
| Michigan Coll. of Mining and Tech. | 2 | — | — | — | — | — | — | — | — | — | — |
| Claremont Colls. | 1 | — | — | — | — | — | — | 1 | — | — | — |

five awarding one-third of the 22,509 degrees. The amount of concentration and diffusion may be expressed another way by saying that the 22 largest universities (all but three being members of the Association of American Universities) conferred 75 percent of the degrees awarded in the decade, while the other 72 universities accounted for 25 percent of them. Columbia University alone conferred more Ph.D.'s during the ten years than fifty of the smaller institutions together. Obviously it would be more difficult to stabilize and improve work for the degree in the fifty institutions than in Columbia; besides, improvements made in the latter institution would soon be widely imitated.

REGIONAL PRODUCTION AND EMPLOYMENT

A knowledge of production and employment of doctoral graduates in its own institution, in relation to the total picture in the home state or region, should be helpful to a graduate faculty in shaping and maintaining its policies. Tables II and III supply different aspects and combinations of this information in so far as it can be revealed by the history of a single decade. It is of course inevitable that such generalizations of data conceal as much as they reveal and that they incline one to inferences beyond those actually warranted. In interpreting the tables, for instance, it must constantly be borne in mind that they do not show the *total* number of doctors of philosophy employed in an area, nor even the total recruited for the decade in question; they present only the employment status as of September 1940 of persons who earned the degree during 1930-31 to 1939-40.

Table II is read as follows: During the 1930's, ten universities in the census region of New England produced 2,065 Ph.D. graduates and employed 1,323 such persons from among those educated by all of the 94 institutions throughout the United States. It trained 582 or 44 percent of the group it employed and secured the remaining 741 or 56 percent from elsewhere. The New England states together employed 64 percent as many Ph.D. recipients as they educated, but only 28 percent of those to whom they actually awarded degrees during the decade. It

TABLE II

SOURCES OF PH.D. DEGREES CONFERRED, 1930-31 TO 1939-40, AND LOCATION OF LIVING RECIPIENTS, AS OF SEPTEMBER 1940; BY REGIONS AND STATES^a

| Region or State | Number of Institutions Conferring Degree | Number of Persons Receiving Degree | Decade's Recipients of Degree Employed in Region or State September 1940 | | | | | | | Ratio of Employment to Total Employment (Percentage of Column 5 is of Column 3) | Ratio of Employment of Ph.D. Recipients Educated in Region to Total Production (Percentage of Column 5 is of Column 3) |
|----------------------------|--|------------------------------------|--|------------------------|------|--------------------------|-------|---------------------------------|-------|---|--|
| | | | Total Number | Trained in Same Region | | Trained in Other Regions | | | | | |
| | | | | No. | % | No. | % | No. of Institutions Represented | | | |
| | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
| Continental United States | 94 | 22,509 | 19,776 ^b | | | | | | 87.9 | | |
| New England ^a | 10 | 2,065 | 1,323 | 582 | 44.0 | 741 | 56.0 | | 64.1 | 28.2 | |
| Connecticut | 2 | 1,235 | 414 | 316 | 76.3 | 98 | 23.7 | 40 | 33.5 | 25.6 | |
| Maine | — | — | 75 | — | — | 75 | 100.0 | 28 | — | — | |
| Massachusetts ^a | 7 | 666 | 617 | 224 | 36.3 | 393 | 63.7 | 46 | 92.6 | 33.6 | |
| New Hampshire | — | — | 85 | — | — | 85 | 100.0 | 25 | — | — | |
| Rhode Island | 1 | 164 | 80 | 42 | 52.5 | 38 | 47.5 | 26 | 48.8 | 25.6 | |
| Vermont | — | — | 52 | — | — | 52 | 100.0 | 18 | — | — | |
| Middle Atlantic | 23 | 6,460 | 5,198 | 3,272 | 62.9 | 1,926 | 37.1 | | 80.5 | 50.7 | |
| New Jersey | 3 | 603 | 662 | 265 | 40.0 | 397 | 60.0 | 54 | 109.8 | 43.9 | |
| New York | 13 | 4,468 | 3,114 | 2,222 | 71.4 | 892 | 28.6 | 63 | 71.9 | 49.7 | |
| Pennsylvania | 7 | 1,389 | 1,422 | 785 | 55.2 | 637 | 44.8 | 61 | 102.4 | 56.5 | |

^a Reports missing from Harvard University and the University of Illinois.

^b The difference between this figure and that in column 3 is accounted for by recipients of degree employed in U. S. territories (138) and foreign countries (964), or whose location was unknown (1631).

TABLE II—Continued

| Region or State | Number of Institutions Conferring Degree | Number of Persons Receiving Degree | Decade's Recipients of Degree Employed in Region or State September 1940 | | | | | | Ratio of Total Em- ployment to Total Production (Percent- age Col- umn 4 is of Column 3) | Ratio of Em- ployment of Ph.D. Recipients Educated in Region to Total Pro- duction (Percentage Column 5 is of Column 3) |
|---------------------------------|--|---|---|-------|--------------------------|-------|-------|---|---|---|
| | | | Trained in Same Region | | Trained in Other Regions | | | | | |
| | | | Total Number | No. | % | No. | % | No. of Insti- tutions Repre- sented | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| East North Central ^a | 15 | 6,156 | 4,096 | 2,488 | 60.7 | 1,608 | 39.3 | | 66.5 | 40.4 |
| Illinois ^a | 3 | 2,070 | 1,232 | 782 | 63.5 | 450 | 36.5 | 61 | 30.5 | 37.8 |
| Indiana | 3 | 350 | 449 | 168 | 37.4 | 281 | 62.6 | 50 | 128.3 | 48.0 |
| Michigan | 3 | 1,104 | 738 | 462 | 62.6 | 276 | 37.4 | 57 | 66.8 | 41.8 |
| Ohio | 3 | 1,233 | 1,183 | 609 | 51.5 | 574 | 48.5 | 60 | 96.0 | 49.4 |
| Wisconsin | 3 | 1,399 | 494 | 467 | 94.5 | 27 | 5.5 | 42 | 35.3 | 33.4 |
| West North Central | 10 | 2,709 | 1,784 | 850 | 47.6 | 934 | 52.4 | | 65.9 | 31.4 |
| Iowa | 2 | 1,157 | 352 | 309 | 87.8 | 43 | 12.2 | 34 | 30.4 | 26.7 |
| Kansas | 2 | 127 | 266 | 52 | 19.5 | 214 | 80.5 | 45 | 209.0 | 40.9 |
| Minnesota | 1 | 809 | 383 | 231 | 60.3 | 152 | 39.7 | 42 | 47.3 | 28.6 |
| Missouri | 3 | 406 | 457 | 163 | 35.7 | 294 | 64.3 | 49 | 112.6 | 40.1 |
| Nebraska | 1 | 194 | 189 | 82 | 43.4 | 107 | 56.6 | 33 | 97.4 | 42.3 |
| North Dakota | 1 | 16 | 59 | 13 | 22.0 | 46 | 78.0 | 19 | 268.7 | 81.2 |
| South Dakota | — | — | 78 | — | — | 78 | 100.0 | 31 | — | — |
| South Atlantic | 13 | 2,027 | 3,028 | 860 | 28.4 | 2,168 | 71.6 | | 149.4 | 42.4 |
| Delaware | — | — | 294 | — | — | 294 | 100.0 | 38 | — | — |
| District of Columbia | 5 | 549 | 1,109 | 188 | 17.0 | 921 | 83.0 | 62 | 202.0 | 34.2 |
| Florida | 1 | 28 | 150 | 12 | 8.0 | 138 | 92.0 | 39 | 535.7 | 42.9 |

| | | | | | | | | | |
|--------------------|----|-------|-------|-----|------|-------|----|---------|------|
| Georgia | — | — | 203 | — | — | 100.0 | 42 | — | — |
| Maryland | 2 | 739 | 337 | 290 | 86.1 | 13.9 | 50 | 45.6 | 39.2 |
| North Carolina | 2 | 470 | 390 | 242 | 62.1 | 37.9 | 47 | 83.0 | 51.5 |
| South Carolina | 1 | 6 | 147 | 5 | 3.4 | 96.6 | 37 | 2,450.0 | 83.3 |
| Virginia | 1 | 196 | 270 | 98 | 36.3 | 63.7 | 45 | 138.0 | 50.0 |
| West Virginia | 1 | 39 | 128 | 25 | 19.5 | 80.5 | 34 | 328.2 | 64.1 |
| East South Central | 5 | 478 | 851 | 197 | 23.1 | 76.9 | — | 178.0 | 41.2 |
| Alabama | — | — | 207 | — | — | 100.0 | 41 | — | — |
| Kentucky | 2 | 175 | 257 | 76 | 29.6 | 70.4 | 38 | 146.9 | 43.4 |
| Mississippi | — | — | 108 | — | — | 100.0 | 29 | — | — |
| Tennessee | 3 | 303 | 279 | 121 | 43.4 | 56.6 | 41 | 92.0 | 39.9 |
| West South Central | 5 | 426 | 1,320 | 307 | 23.3 | 76.7 | — | 309.9 | 72.1 |
| Arkansas | — | — | 121 | — | — | 100.0 | 33 | — | — |
| Louisiana | 2 | 81 | 294 | 53 | 18.0 | 82.0 | 37 | 363.0 | 65.4 |
| Oklahoma | 1 | 29 | 247 | 26 | 10.5 | 89.5 | 42 | 851.7 | 89.7 |
| Texas | 2 | 316 | 658 | 238 | 34.7 | 65.3 | 61 | 208.2 | 72.2 |
| Mountain | 3 | 153 | 586 | 44 | 7.5 | 92.5 | — | 333.0 | 28.8 |
| Arizona | 1 | 16 | 74 | 9 | 12.2 | 87.8 | 28 | 462.5 | 56.3 |
| Colorado | 2 | 137 | 180 | 35 | 19.4 | 80.6 | 38 | 131.4 | 25.7 |
| Idaho | — | — | 57 | — | — | 100.0 | 23 | — | — |
| Montana | — | — | 66 | — | — | 100.0 | 27 | — | — |
| Nevada | — | — | 13 | — | — | 100.0 | 9 | — | — |
| New Mexico | — | — | 74 | — | — | 100.0 | 29 | — | — |
| Utah | — | — | 98 | — | — | 100.0 | 25 | — | — |
| Wyoming | — | — | 24 | — | — | 100.0 | 14 | — | — |
| Pacific | 10 | 2,035 | 1,590 | 937 | 60.2 | 39.8 | — | 78.1 | 47.0 |
| California | 6 | 1,726 | 1,187 | 795 | 67.0 | 33.0 | 57 | 68.8 | 46.1 |
| Oregon | 2 | 38 | 158 | 25 | 15.8 | 84.2 | 33 | 415.8 | 65.8 |
| Washington | 2 | 271 | 245 | 137 | 55.9 | 44.1 | 35 | 90.4 | 50.6 |

must be held in mind that the figures for this region are slightly distorted by the absence of Harvard University from the tabulations. To a lesser extent the same is true for the east-north-central region because the University of Illinois is not included. In general, the table makes evident the degree to which each of the nine regions used by the United States census is dependent on itself or on other regions for the education of its scholarly personnel. Column 11 provides a rough though oversimplified index of the relative tendency to employ "home grown" products.

A few observations may be offered in this connection. It will be seen from column 10 that in five regions production exceeded employment, namely (in descending order) New England, the west-north-central, east-north-central, Pacific, and middle Atlantic regions. But the tendencies of these areas to fill their vacancies with their own graduates varied markedly. At one extreme, the middle Atlantic, Pacific, and east-north-central regions employed (column 11) 51, 47, and 40 percent respectively of the Ph.D.'s they awarded during the decade, and these constituted (column 6) 63, 60, and 61 percent of all representatives of this particular crop whom they had absorbed by the close of the period. At the other end of the scale New England, which actually led the regions in the degree to which it produced more young doctors than it employed, and the west-north-central region showed a decidedly different pattern. They employed only 28 and 31 percent respectively of their own product of the thirties, and these accounted for but 44 and 48 percent of all the young doctors that they did absorb.

There are also interesting contrasts in the case of the four regions that brought in more young Ph.D. recipients than they educated. These in descending order of the ratio of employment to production (column 10) were the mountain, west-south-central, east-south-central, and south Atlantic regions. None of these, of course, was in a position to fill its vacancies largely with its own graduates, and none did (column 6). But the degree to which the effort was made varied sharply. The west-south-central region, for example, absorbed a larger proportion of its

own product than any other, 72 percent (column 11). The south Atlantic and east-south-central regions retained a percentage (42 and 41 respectively) comparable to that of the over-producing regions that were most retentive. The mountain region, whose ratio of production to employment was the slightest of all, absorbed only 29 percent of its own young doctors of the decade; this was almost as small a proportion as in the case of New England where production most exceeded the home capacity to absorb, as far as this decade's output is concerned.

Many educators believe that graduate schools encourage an unwholesome amount of educational inbreeding and insularity through their policies of recruitment and placement. Because of the claim that the census regions are such large categories that the tendencies in this direction get smoothed out, Table II was prepared in such a way as to show the facts for the constituent states as well as for the regions in the continental United States. While we have of course no norm by which to judge when a state is accommodating a proportion of its region's own graduates great enough legitimately to incur the criticism of inbreeding, a study of the picture for the several states does suggest at any rate some evidence in this direction. For instance, again in descending order, Wisconsin, Iowa, Maryland, Connecticut, New York, and California drew on their region's doctoral graduates for the decade to the extent of from 95 to 67 percent of the number they employed (column 6). When the proportions are calculated, however, for the degree to which each of these six employed young doctors educated in the same *state* (rather than region and consequently not included in the table), then the descending rank order becomes as follows: California (62 percent), New York (58), Wisconsin (51), Connecticut (51), Iowa (49), and Maryland (34). This seems to indicate that at least California and New York, and possibly also Wisconsin, Connecticut, and Iowa, may be employing more of the "home grown" product than is socially altogether healthy. The situation in the last three states is accentuated by the fact that doctoral graduates were educated at not more than two or three institutions within the state. If the facts for the University of

Illinois could be added to those for the other three institutions of that state, it is possible that Illinois would be counted among the states drawing rather too heavily on their own product.

The location of prestige institutions within a state, and especially state universities with their low costs to residents, goes far to account for the situation disclosed. The area of recruitment is closely related to the area of effective placement and a glance forward to Table III will establish clearly that many of those among our universities that consider themselves national in scope place a large proportion of their Ph.D. recipients within the region in which they are located. At the other extreme, it will be noted from columns 2 and 3 of Table II that, for a variety of reasons, fifteen states did not themselves award the doctorate to a single one of the 1,555 individuals they together employed from among the decade's doctoral output. Columns 5 to 8 of the same table indicate the on the whole considerable degree of crossfertilization that obtains in high academic and other scholarly circles in the several states. In approximately 70 percent of the states, including the District of Columbia, more than half of the decade's doctors employed had degrees from outside the home region. In half of the states the proportion was above 75 percent. In more than half of the states between thirty and fifty different universities granted the "foreign" degrees, and in nine cases there were more than fifty universities involved.

It should of course not be inferred that the geographic mobility of the persons employed was as great as their academic mobility. The state in which they were employed was probably the home base for most of the group. This fact reduces the probable amount of cultural crossfertilization somewhat, except for the period of training, but it assures the state and region a majority of young doctoral graduates who understand local conditions and mores. The data for this particular decade show more evidence of desirable mutual stimulation than of unhealthy cultural inbreeding, but this generalization should not be used to cover up the known provincialism of particular institutions. And again it must be remembered that the above

TABLE III
LOCATION, AS OF SEPTEMBER 1940, OF LIVING RECIPIENTS OF PH.D. DEGREE, 1930-31 TO 1939-40; BY REGIONS AND INSTITUTIONS

| Institutions (grouped by regions) | Number of Persons Receiving Degree | Location of Degree Holders | | | | | | | | | | China | Other Foreign Countries | Location Unknown | Percentage of Degree Holders Located in Region in Which Received |
|--------------------------------------|---------------------------------------|----------------------------|-----------------|-----------------------|-----------------------|----------------|-----------------------|-----------------------|----------|---------|-------------------|-------|----------------------------|---------------------|---|
| | | New England | Middle Atlantic | East North Central | West North Central | South Atlantic | East South Central | West South Central | Mountain | Pacific | U. S. Territories | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| All Institutions | 22,509 | 1,323 | 5,193 | 4,096 | 1,784 | 3,093 | 851 | 1,920 | 586 | 1,500 | 138 | 315 | 649 | 1,631 | 87.9* |
| NEW ENGLAND | 2,065 | 582 | 442 | 200 | 96 | 243 | 48 | 54 | 30 | 75 | 9 | 26 | 84 | 171 | 23.2 |
| Boston Coll. | 158 | 40 | 6 | 15 | 6 | 10 | 1 | 1 | 3 | 3 | 1 | 1 | 3 | 6 | 88.2 |
| Brown Univ. | 164 | 42 | 46 | 17 | 5 | 27 | 3 | 8 | 4 | 7 | 1 | 2 | 7 | 13 | 92.8 |
| Clark Univ. | 84 | 16 | 23 | 9 | 8 | 7 | 4 | 1 | 4 | 2 | — | — | — | 4 | 10.0 |
| Hartford Sem. Foundation | 48 | 8 | 5 | 6 | 4 | 3 | — | 1 | — | 2 | — | 4 | 16 | 7 | 16.7 |
| Massachusetts Inst. of Tech. | 246 | 65 | 67 | 23 | 6 | 38 | 8 | 7 | 2 | 6 | — | 1 | 16 | 7 | 23.4 |
| Massachusetts State Coll. | 40 | 15 | 6 | 4 | 1 | 5 | 2 | 1 | — | 3 | — | — | 2 | 3 | 37.6 |
| Medford Coll. | 123 | 32 | 22 | 6 | 3 | 17 | — | — | — | 1 | — | — | 6 | 35 | 26.0 |
| Salisbury Coll. | 42 | 11 | 1 | — | — | — | — | — | — | — | — | — | 1 | — | 50.0 |
| Yale Univ. | 1,187 | 308 | 272 | 120 | 63 | 141 | 80 | 86 | 19 | 52 | 8 | 18 | 82 | 88 | 23.9 |
| MIDDLE ATLANTIC | 6,460 | 315 | 3,272 | 529 | 199 | 707 | 140 | 107 | 82 | 160 | 34 | 108 | 211 | 508 | 60.7 |
| Brooklyn Polytechnic Inst. of | 15 | 1 | 1 | 1 | 1 | 1 | — | 1 | — | 1 | — | — | — | — | 73.3 |
| Bryn Mawr Coll. | 95 | 15 | 41 | 4 | 1 | 9 | — | 1 | — | — | — | 1 | 3 | 20 | 43.2 |
| Buffalo, Univ. of | 27 | 9 | 9 | 2 | 1 | — | — | — | — | — | — | — | — | — | 75.0 |
| Columbia Univ. | 1,851 | 107 | 950 | 143 | 63 | 171 | 42 | 54 | 27 | 57 | 18 | 27 | 68 | 135 | 10.7 |
| Cornell Univ. | 1,971 | 68 | 409 | 138 | 51 | 214 | 47 | 62 | 23 | 40 | 13 | 40 | 69 | 106 | 52.2 |
| Drew Univ. | 33 | 1 | 13 | 4 | — | 2 | 2 | 1 | — | 2 | — | 2 | 2 | 2 | 39.4 |
| Dropsie Coll. | 22 | 1 | 15 | — | — | 1 | 1 | 1 | — | — | — | — | 2 | 2 | 68.2 |
| Duquesne Univ. | 6 | — | 2 | — | — | — | — | — | — | — | — | — | — | — | 40.0 |
| Longman Univ. | 207 | 8 | 160 | 8 | 7 | 6 | 3 | 2 | — | — | — | — | 4 | 9 | 77.3 |
| N. Y. State Coll. of Forestry | 13 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| N. Y. State Coll. of Agric. | 15 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| New York Univ. | 850 | 24 | 564 | 23 | 20 | 45 | 16 | 19 | 12 | 10 | 1 | 9 | 7 | 70 | 66.4 |
| Niagara Univ. | 25 | 0 | 24 | — | — | — | — | — | — | — | — | — | — | — | 96.0 |
| Pennsylvania State Coll. | 224 | 9 | 116 | 29 | 7 | 32 | 5 | 10 | 3 | 3 | — | 3 | 7 | 7 | 51.8 |
| Pennsylvania Univ. of | 615 | 15 | 371 | 24 | 12 | 76 | 9 | 12 | 4 | 8 | 4 | 11 | 9 | 60 | 60.3 |
| Pittsburgh Univ. of | 401 | 14 | 222 | 42 | 4 | 38 | 5 | 6 | 3 | 3 | — | 1 | 2 | 61 | 55.4 |
| Princeton Univ. | 427 | 31 | 116 | 42 | 19 | 63 | 4 | 17 | 5 | 23 | 1 | 3 | 30 | 13 | 40.7 |
| Rochester Polytechnic Inst. | 116 | 16 | 31 | 10 | 8 | 18 | 3 | 5 | 1 | 1 | — | — | 2 | 8 | 89.7 |
| Rochester Univ. | 116 | 46 | 46 | 10 | 8 | 18 | 3 | 5 | 1 | 1 | 1 | 1 | 5 | 3 | 62.4 |
| Rutgers Univ. | 93 | 5 | 53 | 1 | 3 | 7 | 1 | 4 | 3 | 1 | 1 | 1 | — | — | 100.0 |
| St. John's Univ. (Brooklyn) | 3 | — | 3 | — | — | — | — | — | — | — | — | — | — | — | — |
| Syracuse Univ. | 27 | 1 | 19 | 9 | 1 | 14 | 1 | 4 | 1 | 2 | — | 1 | — | 5 | 33.3 |
| Union Theol. Sem. | 66 | 1 | 7 | 4 | 2 | 2 | 1 | — | — | — | — | — | — | — | 27.0 |

* Degree holders located in continental United States.

TABLE III—Continued

| Institutions (grouped by regions) | Number of Persons Receiving Degree | Location of Degree Holders | | | | | | | | | | | | Percentage of Degree Holders Located in Region in Which Received | |
|--|---------------------------------------|----------------------------|-----------------|-----------------------|-----------------------|----------------|-----------------------|-----------------------|----------|---------|-------------------|-------|----------------------------|---|---------------------|
| | | New England | Middle Atlantic | East North Central | West North Central | South Atlantic | East South Central | West South Central | Mountain | Pacific | U. S. Territories | China | Other Foreign Countries | | Location Unknown |
| EAST NORTH CENTRAL | 6,166 | 191 | 730 | 2,488 | 443 | 695 | 222 | 284 | 168 | 212 | 39 | 100 | 164 | 420 | 40.4 |
| Chicago, Univ. of | 1,649 | 61 | 161 | 584 | 151 | 205 | 69 | 104 | 56 | 59 | 15 | 35 | 76 | 73 | 55.4 |
| Cincinnati, Univ. of | 143 | 4 | 14 | 71 | 5 | 11 | 5 | 5 | 1 | 6 | 1 | 2 | 1 | 17 | 49.7 |
| Indiana Univ. | 153 | 2 | 6 | 82 | 13 | 20 | 9 | 5 | 1 | 4 | 1 | 1 | 1 | 8 | 53.6 |
| Lawrence Coll. (Inst. of Paper Chem.) | 45 | — | — | — | — | 1 | — | — | — | — | — | — | — | 44 | — |
| Loyola Univ. (Chicago) | 12 | — | — | 7 | 1 | 1 | — | — | — | — | — | — | — | 3 | 58.3 |
| Marquette Univ. | 26 | — | — | 18 | 2 | 1 | — | — | — | — | — | — | — | 5 | 69.2 |
| Michigan Coll. of Mining and Tech. | 2 | — | — | — | — | — | — | — | — | — | — | — | — | — | 100.0 |
| Michigan State Coll. | 84 | 3 | 9 | 29 | 7 | 11 | 5 | 5 | 2 | 3 | — | 4 | 1 | 5 | 34.5 |
| Michigan, Univ. of | 1,018 | 41 | 130 | 431 | 66 | 91 | 23 | 46 | 19 | 38 | 7 | 30 | 26 | 70 | 42.3 |
| Northwestern Univ. | 1,409 | 7 | 33 | 191 | 18 | 33 | 9 | 10 | 10 | 16 | 2 | 1 | 7 | 72 | 46.7 |
| Notre Dame Univ. of | 60 | 14 | 14 | 92 | 2 | 12 | — | 1 | 4 | 4 | 3 | 16 | 5 | 1 | 56.7 |
| Ohio State Univ. | 937 | 18 | 148 | 443 | 47 | 108 | 51 | 88 | 26 | 21 | 3 | 1 | 5 | 13 | 47.3 |
| Purdue Univ. | 137 | 3 | 25 | 64 | 7 | 13 | 1 | 5 | 1 | 5 | 1 | 1 | 2 | 9 | 46.7 |
| Western Reserve Univ. | 135 | 5 | 20 | 85 | 8 | 12 | 1 | 1 | 3 | 1 | — | — | — | 7 | 62.1 |
| Wisconsin, Univ. of | 1,323 | 47 | 170 | 449 | 116 | 177 | 49 | 63 | 45 | 55 | 9 | 10 | 45 | 93 | 33.8 |
| WEST NORTH CENTRAL | 2,709 | 64 | 267 | 474 | 850 | 248 | 35 | 211 | 121 | 117 | 11 | 29 | 76 | 156 | 31.4 |
| Iowa State Coll. | 430 | 12 | 54 | 59 | 100 | 43 | 23 | 45 | 33 | 18 | 3 | 5 | 17 | 18 | 23.3 |
| Iowa, State Univ. of | 727 | 17 | 80 | 161 | 209 | 44 | 19 | 54 | 33 | 32 | 5 | 8 | 4 | 61 | 28.9 |
| Kansas State Coll. | 7 | — | 1 | 1 | 2 | — | — | 1 | — | — | — | — | — | — | 28.6 |
| Kansas, Univ. of | 190 | 2 | 4 | 23 | 50 | 13 | 5 | 11 | 5 | 5 | 1 | — | 1 | 1 | 41.7 |
| Minnesota, Univ. of | 809 | 22 | 92 | 130 | 231 | 102 | 18 | 38 | 22 | 43 | 1 | 15 | 48 | 47 | 23.6 |
| Missouri, Univ. of | 187 | 9 | 13 | 19 | 83 | 14 | 7 | 30 | 8 | 5 | — | — | 3 | 5 | 44.4 |
| Nebraska, Univ. of | 194 | 1 | 11 | 31 | 82 | 20 | 6 | 15 | 11 | 7 | 1 | — | 1 | 6 | 42.3 |
| North Dakota, Univ. of | 16 | — | — | 1 | 13 | — | — | — | 5 | 2 | — | — | — | 2 | 81.3 |
| St. Louis Univ. | 110 | 3 | 6 | 30 | 42 | 4 | 3 | 10 | 5 | 2 | — | — | — | 3 | 38.2 |
| Washington Univ. (St. Louis) | 109 | 5 | 6 | 19 | 38 | 8 | 4 | 7 | 4 | 4 | — | 1 | — | 13 | 34.9 |

| | | | | | | | | | | | | | | | |
|------------------------------------|-------|----|-----|-----|----|-----|-----|-----|-----|-----|----|----|----|-----|-------|
| SOUTH ATLANTIC | 2,027 | 98 | 303 | 197 | 76 | 800 | 124 | 108 | 18 | 57 | 7 | 16 | 29 | 134 | 42.4 |
| American Univ. | 73 | — | 6 | 2 | 2 | 49 | — | — | — | 1 | 1 | 2 | 6 | 4 | 67.1 |
| Brookings Inst. | 18 | — | 2 | — | — | 10 | 1 | — | — | — | — | — | 1 | 3 | 55.6 |
| Catholic Univ. of America | 369 | 29 | 69 | 79 | 42 | 62 | 26 | 18 | 5 | 20 | — | — | 8 | 11 | 16.8 |
| Duke Univ. | 230 | 8 | 22 | 18 | 7 | 110 | 23 | 1 | 6 | 2 | 1 | 1 | — | 10 | 47.8 |
| Florida, Univ. of | 23 | 2 | 4 | 4 | 2 | 12 | — | — | — | 2 | — | — | — | 1 | 42.9 |
| George Washington Univ. | 42 | — | 5 | 1 | — | 32 | — | — | — | 1 | 1 | 1 | — | 1 | 76.2 |
| Georgetown Univ. | 47 | 1 | 4 | 1 | — | 35 | — | — | — | 2 | — | — | 1 | 3 | 74.4 |
| Johns Hopkins Univ. | 592 | 37 | 111 | 63 | 11 | 195 | 21 | 25 | 5 | 20 | 3 | 8 | 9 | 84 | 32.9 |
| Maryland, Univ. of | 147 | 4 | 21 | 9 | 2 | 95 | — | 27 | 1 | 4 | 1 | 2 | 1 | 4 | 64.6 |
| North Carolina, Univ. of | 240 | 6 | 18 | 11 | 3 | 132 | 30 | — | — | 4 | — | — | 2 | 6 | 55.5 |
| South Carolina, Univ. of | 6 | — | — | — | — | 5 | 1 | — | — | — | — | — | — | — | 82.7 |
| Virginia, Univ. of | 198 | 10 | 34 | 8 | 7 | 98 | 16 | 12 | 2 | 2 | — | 1 | 1 | 5 | 50.0 |
| West Virginia, Univ. of | 39 | 1 | 7 | 1 | — | 25 | 1 | 1 | — | — | — | 1 | — | 2 | 64.1 |
| EAST SOUTH CENTRAL | 478 | 2 | 8 | 36 | 18 | 109 | 197 | 67 | 4 | 3 | 1 | 4 | 9 | 20 | 41.2 |
| George Peabody Coll. | 211 | 1 | 3 | 12 | 12 | 50 | 80 | 50 | 2 | 1 | — | — | — | — | 37.9 |
| Kentucky, Univ. of | 43 | — | — | 5 | — | 5 | 34 | 2 | — | — | — | — | — | 2 | 70.8 |
| South'n Baptist Theol. Sem. | 127 | 1 | — | 15 | 2 | 33 | 42 | 9 | 2 | 2 | — | 3 | 8 | 10 | 33.1 |
| Tennessee, Univ. of | 3 | — | — | — | — | 1 | 2 | — | — | — | — | — | — | — | 66.7 |
| Vanderbilt Univ. | 89 | — | 5 | 4 | 4 | 20 | 39 | 6 | — | — | 1 | 1 | 1 | 8 | 43.8 |
| WEST SOUTH CENTRAL | 426 | 2 | 18 | 18 | 10 | 18 | 12 | 307 | 9 | 5 | 6 | 1 | 4 | 16 | 72.1 |
| Louisiana State Univ. | 66 | — | 3 | 2 | 2 | — | 1 | 48 | 3 | — | 1 | 1 | 2 | 3 | 72.7 |
| Oklahoma, Univ. of | 29 | — | — | — | — | 2 | — | 26 | — | — | — | — | — | 1 | 89.7 |
| Rice Inst. | 40 | — | 6 | 5 | — | 1 | 1 | 23 | 6 | 1 | 1 | — | 1 | 1 | 57.5 |
| Texas, Univ. of | 276 | 2 | 8 | 10 | 7 | 11 | 9 | 205 | — | 4 | 3 | — | — | 11 | 74.8 |
| Tulane Univ. | 15 | — | 1 | 1 | 1 | 4 | 1 | 5 | — | — | 1 | — | 1 | — | 33.3 |
| MOUNTAIN | 153 | 1 | 13 | 20 | 18 | 13 | 3 | 18 | 44 | 4 | 2 | 2 | 1 | 14 | 98.8 |
| Arizona, Univ. of | 16 | — | — | — | — | 2 | — | 3 | 9 | — | 2 | 1 | — | — | 56.3 |
| Colorado State Coll. of Ed. | 30 | — | 1 | 5 | 6 | 1 | 1 | 5 | 9 | — | — | 1 | — | 1 | 30.0 |
| Colorado, Univ. of | 107 | 1 | 12 | 15 | 12 | 10 | 2 | 11 | 26 | 4 | — | — | 1 | 13 | 24.3 |
| PACIFIC | 2,035 | 68 | 145 | 134 | 74 | 130 | 20 | 74 | 110 | 937 | 29 | 29 | 71 | 194 | 47.0 |
| California, Univ. of (Berkeley) | 950 | 36 | 70 | 63 | 32 | 72 | 11 | 35 | 49 | 449 | 15 | 8 | 38 | 72 | 47.3 |
| California, Univ. of (Los Angeles) | 5 | 1 | — | — | — | — | — | — | 2 | 2 | — | — | — | — | 40.0 |
| California Inst. of Tech. | 185 | 8 | 21 | 16 | 6 | 10 | 2 | 5 | 5 | 57 | — | 4 | 6 | 45 | 30.8 |
| Claremont Colls. | 1 | — | — | — | — | — | — | — | 3 | 1 | — | — | — | — | 100.0 |
| Oregon State Coll. | 18 | — | — | — | — | 1 | — | 1 | — | 12 | — | — | 1 | — | 66.7 |
| Oregon, Univ. of | 20 | — | 1 | 1 | 2 | 1 | — | — | — | 13 | — | — | — | — | 65.0 |
| South'n Calif., Univ. of | 192 | — | 9 | 8 | 7 | 10 | — | 8 | 8 | 115 | 3 | 9 | 4 | 10 | 59.9 |
| Stanford Univ. | 893 | 18 | 29 | 23 | 15 | 22 | 2 | 14 | 29 | 171 | 5 | 4 | 10 | 51 | 43.5 |
| Washington, State Coll. of | 27 | — | 4 | 4 | 1 | 14 | — | — | 3 | 14 | — | — | 1 | — | 61.8 |
| Washington, Univ. of (Seattle) | 244 | 5 | 11 | 19 | 11 | — | 5 | 8 | 11 | 133 | 6 | 4 | 11 | 16 | 50.4 |

figures cover only part of the total situation. For instance, the circumstance that three of the New England states failed to employ any of the decade's Ph.D. graduates trained in that region does not by any means preclude the possibility that they called to their universities older persons and established scholars who had received their degrees in New England before 1931. Another possibility is that the home situation had reached such a degree of saturation with local scholars that a deliberate attempt was made during the decade to go outside the region. The information collected for this study has no light to throw on questions such as these.

Because of these limitations of the data the reader is warned not to make comparisons among the several states and regions unless he has more facts at his disposal. Not only do such factors as relative wealth, size of population, and the number of possible positions of Ph.D. caliber locally available enter into the picture, but also the less tangible factors of local policy. One state may be more particular than another about the academic standing of museum, laboratory, or school personnel, and able to back its preference with adequate salary schedules. Some universities may deliberately engage a steady stream of younger persons, expecting a high turnover and believing that in this way they are likely to get the highest value out of the money they have to spend. Others may not be able to hold scholars as soon as they achieve more than local reputations and so be forced to look only to younger men. Still other universities may prefer to wait until a doctoral graduate has established himself before calling him to their faculties. And others may follow some combination of these procedures. For such reasons it is hazardous to make comparisons without knowing at least the total employment picture for the institutions here in question for the ten years studied.

Two other aspects of the regional employment of Ph.D. recipients were studied but the tables are not reproduced since there were no significant findings. Graduate school officials were interested to know whether the geographic distributions of production and employment would be different for the group

that received the degree in 1930-31 compared with the group of 1939-40. The several years of the decade showed no trends and only chance variations in concentration and diffusion. The table of regional placement by departments or major fields indicated for the regular academic subjects, such as English or history, that each region got almost the same proportion as its total or college population bore to the respective national figures. Chemistry is an extreme example of a few fields that sent as many as half of their representatives to a single census region, in this case the middle Atlantic states where industrial laboratories are heavily concentrated.

Further light on this matter of inbreeding and crossfertilization is provided by Table III, in which the degree-granting institutions are grouped according to their geographic region, and the doctoral graduates according to the region in which they were employed in September 1940. It may be of interest to note that four rather distinct patterns of distribution may be discerned: national, national with regional emphasis, biregional, and predominantly regional. If at least 5 percent of an institution's doctoral graduates for whom the information was available were placed each in a minimum of 5 census regions in the continental United States, and never more than 33 percent of them appeared in any one region, the pattern of distribution may be called national. There are 13 universities in this category of which Johns Hopkins, Yale, and the Catholic University of America are examples. If similarly at least 5 percent of the graduates each appeared in a minimum of five regions but between a third and half of them were placed in a single region, then the distribution may be described as national with regional emphasis. There are 31 institutions classifiable in this way, among them being Northwestern and Stanford. If, however, less than five regions showed at least 5 percent of the distribution in each case, and half or more were concentrated in two regions, then the pattern may be described as biregional. Massachusetts Institute of Technology is an example of the 8 institutions in this category. If the same degree of concentration or higher occurred in a single region, the pattern may be described as pre-

dominantly regional in character. The 41 institutions classifiable in this way include the large universities in New York City: Columbia, Fordham, and New York. For the remaining unclassified institution, the Paper Chemistry Institute of Lawrence College in Wisconsin, information was not available on the placement of its doctoral graduates.

The two outstanding patterns of distribution are those designated national with regional emphasis and predominantly regional. As is the case with radio stations, both strength and geographical location in relation to population must be taken into account when estimating a particular institution's area of influence. For most of the universities here studied (77 percent) the pattern of placement is so distinctly regional—and would be more so if natural rather than census regions were used—as to suggest that the focus of local policy should be the major service area. This would mean examining the area for new and undeveloped opportunities based on local life, and restricting the production of Ph.D. graduates to meet the needs of known and foreseeable fields of service.

Another conclusion warranted by Table III is that when employing agencies do go outside their region for doctoral candidates, they turn most frequently to the nationally strong universities rather than to those of closer geographic proximity but less prestige. For example, the east-south-central, west-south-central, and mountain regions which depend on outside institutions for educating most of their scholarly workers, turn for most of their Ph.D. personnel to less than a dozen nationally known universities. The same is true likewise of the outlying territories of the United States and foreign countries. Or, to state the same facts from a different angle, when these consumer regions send their people away to study for the doctorate they send them to the prestige institutions of the country.

NATURE OF THE EMPLOYMENT

Persons who want to improve the program of a particular graduate school will find a factual picture of the nature of doctoral employment (and unemployment) on a national scale

helpful—perhaps more so than the overview already presented of where a decade of Ph.D. graduates were educated and where they were employed. Graduate faculties would like to know how their institution compares with others in the proportion of doctors placed in institutions of higher education, in other educational agencies, and in nonacademic pursuits. It is also helpful in checking on effectiveness to know how their own institution compares with others and with crude norms for the nation with respect to such categories as position unknown, not seeking employment (housewives and the like), unemployable, and actually unemployed. The remainder of this chapter is devoted to groupings of data under these heads for the 22,509 Ph.D. recipients studied, to show the situation from three perspectives: trends by years of the decade, the national picture as seen through institutional distributions, and the mosaic produced by an analysis according to departmental or major fields of study.

Table IV shows the employment status as of September 1940 of persons who were from a few months to ten years out of graduate school. As a preliminary to interpreting it, the reader should note that the several annual distributions present a detailed analysis of the data for the decade; he should also familiarize himself with the three footnotes which explain what is subsumed under the headings “higher education,” “other education,” and “nonacademic pursuits.” Perhaps the most significant facts of the table come from reading it by rows, the first of which after the headings, for example, says that during the decade 94 institutions granted the Ph.D. degree to 22,509 persons who were alive in September 1940. And of this group 13,516 or 60 percent were employed in institutions of higher education, 2,239 or 6 percent were employed in other agencies of education, and 6,028 or 27 percent were employed in non-academic pursuits. The employment status of 864 persons, approximately 4 percent of the group, was not known by the officials of their graduate schools, but they knew that 862 other individuals were not gainfully employed. What is more important, they knew that 485 or 56 percent of the persons not gain-

TABLE IV
EMPLOYMENT STATUS, AS OF SEPTEMBER 1940, OF LIVING RECIPIENTS OF PH.D. DEGREE, 1930-31 TO 1939-40;
BY YEARS OF DEGREE AWARD

| Year | No. of Institutions Conferring Degree | No. of Persons Receiving Degree | Status of All Degree Holders | | | | | | | | | | Status of Degree Holders not Gainfully Employed | | | | | |
|------------------------------|--|------------------------------------|-------------------------------------|------|------------------------------------|-----|--|------|--|-----|--------------------------------|-----|--|------|-------------------|-----|-----------------|------|
| | | | Employed | | | | | | Employ- ment Stat- us Un- known | | Not Gain- fully Employed | | Not Seek- ing Em- ployment | | Unemploy- able | | Unem- ployed | |
| | | | In Higher Education ^a | | In Other Education ^b | | In Non- academic Pursuits ^c | | No. | | No. | | No. | | No. | | No. | |
| | | | % | | % | | % | | % | | % | | % | | % | | % | |
| | | | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| Decade 1930-31 1939-40 | 94 | 22,509 | 13,516 | 60.1 | 1,239 | 5.5 | 6,023 | 26.8 | 864 | 3.8 | 862 | 3.8 | 485 | 56.3 | 25 | 2.9 | 352 | 40.8 |
| 1930-31 | 74 | 1,910 | 1,146 | 60.0 | 103 | 5.4 | 516 | 27.0 | 82 | 4.3 | 63 | 3.3 | 49 | 77.8 | 5 | 7.9 | 9 | 14.3 |
| 1931-32 | 74 | 2,070 | 1,247 | 60.2 | 112 | 5.4 | 535 | 25.9 | 98 | 4.7 | 78 | 3.8 | 60 | 76.9 | — | — | 18 | 23.1 |
| 1932-33 | 75 | 2,053 | 1,193 | 58.1 | 116 | 5.6 | 568 | 27.7 | 113 | 5.5 | 63 | 3.1 | 47 | 74.6 | 2 | 3.2 | 14 | 22.2 |
| 1933-34 | 78 | 2,290 | 1,283 | 56.0 | 134 | 5.9 | 671 | 29.3 | 116 | 5.0 | 86 | 3.8 | 66 | 76.7 | 6 | 7.0 | 14 | 16.3 |
| 1934-35 | 85 | 2,268 | 1,389 | 61.2 | 113 | 5.0 | 630 | 27.8 | 74 | 3.3 | 62 | 2.7 | 44 | 71.0 | 1 | 1.6 | 17 | 27.4 |
| 1935-36 | 83 | 2,183 | 1,322 | 60.6 | 131 | 6.0 | 568 | 26.0 | 74 | 3.4 | 88 | 4.0 | 53 | 60.2 | 5 | 5.7 | 30 | 34.1 |
| 1936-37 | 86 | 2,324 | 1,395 | 60.0 | 126 | 5.4 | 628 | 27.0 | 95 | 4.1 | 80 | 3.5 | 45 | 56.2 | 1 | 1.3 | 34 | 42.5 |
| 1937-38 | 81 | 2,300 | 1,431 | 62.2 | 115 | 5.0 | 588 | 25.6 | 69 | 3.0 | 97 | 4.2 | 47 | 48.5 | 3 | 3.0 | 47 | 48.5 |
| 1938-39 | 87 | 2,479 | 1,539 | 62.1 | 144 | 5.8 | 635 | 25.6 | 64 | 2.6 | 97 | 3.9 | 31 | 32.0 | 1 | 1.0 | 65 | 67.0 |
| 1939-40 | 84 | 2,632 | 1,571 | 59.7 | 145 | 5.5 | 689 | 26.2 | 79 | 3.0 | 148 | 5.6 | 43 | 29.0 | 1 | .7 | 104 | 70.3 |

^a Includes, according to United States Office of Education practice, persons employed in all accredited 4-, 3-, and 2-year colleges, professional or technical schools, teachers colleges, normal schools, and junior colleges, or in unaccredited 4-year colleges enrolling at least 100, 2-year institutions enrolling at least 50, or independent professional or technical schools enrolling at least 25 students.

^b Includes persons employed in all precollegiate agencies of public or private education and in state departments of education, but not those employed by private agencies that promote education.

^c Includes workers in government, industry, welfare and promotional agencies of a public or private nature, as well as all others not accounted for in the preceding columns.

fully employed were married women, retired professors, and others not seeking employment; that 25 or 3 percent of the subgroup were unemployable for reasons of health; and that only 352 persons, 41 percent of the 862 not gainfully employed and less than 2 percent of the whole group, were seeking employment.

Columns 5, 7, and 9 of Table IV indicate that there were no more than chance variations and no established trends during the decade in either of the three major categories of employment, unless a new direction was being set by the figures for 1939-40. Implications for graduate school practice of the fact that 60 percent of *all* Ph.D. recipients of the decade (the proportion would be higher if only *employed* doctors were used as the base) were professionally active in institutions of higher education, and that nearly 27 percent of them were engaged in non-academic scholarly work, are left to the succeeding chapter where these gross totals are analyzed to show employment by types of educational and nonacademic agency and by the nature of the function mainly performed, such as teaching, research, and administration.

The improperly and the not gainfully employed

Columns 10 to 19 of Table IV indicate that it would be an oversimplification to propose an examination of graduate school effectiveness in terms of actual unemployment alone. Almost every graduate school has holders of the Ph.D. degree employed in work not consonant with their training, others whose employment status is unknown, and as many more who are not gainfully employed but half of whom are not seeking employment. Actual data show that nearly 9 percent of the decade's doctoral graduates were in these unproductive categories in September 1940; conservative interpolation made on the basis of supplementary information indicates that at least 12 percent should be so classified. In such matters university officials were either not well informed or were inclined to take the benefit in doubtful cases, as for instance in listing a man employed by the United States Department of Agriculture as

engaged in research when further check indicated he was performing routine duties unrelated to his field of competence. The policy dislocations implicit in the facts of columns 10-19 of Table IV may well have made deans sensitive and fearful lest their situation be worse than that of neighboring institutions. The purpose in presenting the facts is, however, not to trace them back to their causes but to provide a stimulus for overhauling administrative procedure.

A spot check of 7,394 of the 20,783 recipients of the Ph.D. degree during the decade listed by their graduate schools as employed, discovered 228 persons engaged in work obviously unrelated to their training or at levels within the field which required no more than undergraduate preparation. Among such positions were those of village postmaster, rental agent, infantry lieutenant, laundry manager, village banker, police-court judge, and a variety of clerical workers on WPA projects. Other obvious misplacements included the holder of a Ph.D. in Greek employed to retail bakery products, another in history who operated a retail flower shop, and still another in oriental languages who worked as a podiatrist. It is hoped that since 1940 the demands for trained personnel for the prosecution of the war have at least temporarily corrected such wastes of trained manpower. These data suggest that a definitive check would reveal improper placement to be a greater problem for graduate schools than actual unemployment. Our scholarly workers are not driven out of gainful employment to anything like the extent to which they are forced into work where they cannot capitalize on their special competence.

A comparison of columns 10-11 with 12-13 of Table IV documents what would be expected; the more recently graduated the group of doctors the more graduate school officials know of their employment status. The distributions also permit the inference that this greater knowledge rather than actual differences in employment accounts for the trends shown for the decade by the two sets of columns. This generalization of course does not cover the greater dislocations shown by each for the depression years of 1931-1934. Except for the prospects of a few institu-

tions which are shown by the next table (Table V, columns 10 and 11) to be unusually derelict about keeping up with their doctoral graduates, supplementary investigation shows that most of the 864 persons whose status is reported as unknown actually belong in the category of not gainfully employed. Nevertheless the analysis to follow is limited to the 862 persons specifically reported by their graduate schools as not gainfully employed.

In order to get at the actually unemployed who were looking for employment it was necessary to screen out the unemployables and those not seeking work. Columns 14 through 19 of Table IV show the distribution of the 862 persons in question by the three categories. The 25 unemployables ranged from mild cases of nervous breakdown to individuals confined in insane asylums and penal institutions. Housewives and retired professors made up the bulk of the 485 persons not looking for gainful employment. This left but 352 doctoral graduates out of the whole 22,509 who were reported by their graduate schools as wholly unemployed. The trend over the decade follows about the pattern educators would expect: the unemployables were a chance phenomenon while the number and proportion of the actually unemployed increased slightly for each year of the decade through 1937-38 and rapidly for the two remaining years. For the benefit of those who might like to study this situation from the perspectives of particular institutions or departments, Tables V and VI (in each case columns 10 through 13) have been prepared. Inspection makes it evident that the summary situation presented in Table IV would be materially changed if a dozen institutions, or half a dozen departments, could improve their placement service. Just what they should do and how they should go about it are, of course, questions beyond the scope of this report.

Placement by institutions and departments

The overview turns now to an analysis of the three major categories of employment as they are seen from the institutional and departmental standpoints. Since the school and the depart-

TABLE V

EMPLOYMENT STATUS, AS OF SEPTEMBER 1940, OF LIVING RECIPIENTS OF PH.D. DEGREE, 1930-31 TO 1939-40;
BY INSTITUTIONS CONFERRING DEGREE

| Institutions | Number of Degrees Which Was Awarded ^a | Number of Persons Receiving Degree | Status of Degree Holders | | | | | | | | | |
|---------------------------------|--|------------------------------------|----------------------------------|-------|----------|------|--------------------------------------|------|---------------------------|------|-------------------------------------|------|
| | | | In Higher Education ^b | | Employed | | In Nonacademic Pursuits ^c | | Employment Status Unknown | | Not Gainfully Employed ^d | |
| | | | No. | % | No. | % | No. | % | No. | % | No. | % |
| | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| All Institutions | | 22,509 | 13,516 | 60.1 | 1,239 | 5.5 | 6,028 | 26.8 | 864 | 3.8 | 862 | 3.8 |
| American Univ. | 19 | 73 | 13 | 17.8 | 2 | 2.7 | 53 | 72.7 | 3 | 4.1 | 2 | 2.7 |
| Arizona State Univ. | 3 | 16 | 17 | 43.8 | — | — | 9 | 56.2 | — | — | — | — |
| Boston Coll. | 7 | 158 | 17 | 20.3 | 35 | 60.4 | 4 | 6.9 | — | — | 2 | 3.4 |
| Boston Univ. | 12 | 113 | 68 | 60.3 | 7 | 6.2 | 20 | 17.7 | 15 | 13.3 | 3 | 2.7 |
| Brookings Inst. | 1 | 13 | 4 | 30.8 | — | — | 11 | 81.1 | 1 | 7.6 | 2 | 11.1 |
| Brooklyn Polytechnic Inst. of | 2 | 15 | 4 | 26.7 | — | — | 11 | 73.4 | 2 | 13.3 | — | — |
| Brown Univ. | 10 | 164 | 93 | 56.8 | 3 | 1.8 | 55 | 33.2 | — | — | 8 | 4.9 |
| Bryn Mawr Coll. | 10 | 95 | 63 | 66.3 | 9 | 9.5 | 13 | 13.7 | 3 | 3.2 | 17 | 17.9 |
| Buffalo, Univ. of | 4 | 12 | 3 | 25.0 | — | — | 7 | 58.3 | — | — | 2 | 16.7 |
| California Inst. of Tech. | 7 | 185 | 86 | 46.5 | — | — | 53 | 28.6 | 46 | 24.9 | — | — |
| California, Univ. of (Berkeley) | 36 | 950 | 629 | 66.2 | 20 | 2.1 | 210 | 22.1 | 33 | 3.5 | 68 | 6.1 |
| Catholic Univ. of (Los Angeles) | 8 | 5 | 4 | 30.0 | — | — | 1 | 20.0 | — | — | — | — |
| Carnegie Inst. of Tech. | 3 | 27 | 12 | 44.4 | — | — | 15 | 55.6 | — | — | — | — |
| Catholic Univ. of America | 22 | 369 | 234 | 77.0 | 37 | 10.0 | 35 | 9.5 | 6 | 1.6 | 7 | 1.9 |
| Chicago, Univ. of | 36 | 1,049 | 1,102 | 70.5 | 44 | 2.7 | 365 | 22.1 | 22 | 1.3 | 56 | 3.4 |
| Cincinnati, Univ. of | 16 | 143 | 69 | 48.2 | 2 | 1.4 | 55 | 38.5 | 12 | 8.4 | 5 | 3.5 |
| Clemson Univ. | 1 | 1 | 1 | 100.0 | — | — | — | — | — | — | — | — |
| Clark Univ. | 3 | 84 | 50 | 59.6 | 4 | 4.8 | 15 | 17.8 | 5 | 6.0 | 4 | 4.8 |
| Colorado State Coll. of Ed. | 1 | 30 | 17 | 56.7 | 6 | 20.0 | 4 | 13.3 | 2 | 6.7 | 1 | 3.3 |
| Colorado, Univ. of | 16 | 107 | 60 | 56.1 | — | — | 33 | 30.8 | 3 | 2.8 | 11 | 10.3 |
| Columbia Univ. | 29 | 1,851 | 1,075 | 58.1 | 222 | 12.0 | 573 | 20.3 | 83 | 4.8 | 88 | 4.8 |
| Cornell Univ. | 30 | 1,271 | 785 | 61.7 | 34 | 2.7 | 342 | 26.1 | 50 | 3.9 | 58 | 4.6 |
| Drew Univ. | 1 | 33 | 15 | 45.5 | 1 | 3.0 | 17 | 51.5 | — | — | — | — |
| Dropsie Coll. | 4 | 22 | 3 | 13.6 | 6 | 27.4 | 11 | 50.0 | 1 | 4.5 | 1 | 4.5 |
| Duke Univ. | 26 | 230 | 166 | 72.2 | 3 | 1.3 | 40 | 21.3 | 2 | 0.9 | 10 | 4.3 |
| Duquesne Univ. | 4 | 5 | 1 | 20.0 | — | — | 21 | 40.0 | 3 | 60.0 | — | — |
| Florida, Univ. of | 3 | 28 | 13 | 46.4 | — | — | 14 | 50.0 | — | — | 1 | 3.6 |

^a Institutions do not follow a common definition of a department or field of study. The pattern here used is comparable to that used in the American Council on Education's *American Universities and Colleges* and in the Association of Research Libraries' *Dissertation Abstracts*. Hence the number of degrees attributed to an institution may differ from the number it itself recognizes.

^b See sections a, b, and c of Table IV, for explanation of these categories.

^c Includes persons at seeking employment (e.g., housewives) and unemployed, as well as those definitely seeking positions. For indication of relative sizes of these groups see Table IV, columns 14-16.

| | | | | | | | | | | | | |
|--|----|-------|-----|-------|-----|------|-----|-------|----|------|----|------|
| Fordham Univ. | 80 | 207 | 91 | 44.0 | 83 | 40.1 | 23 | 11.1 | 6 | 2.9 | 4 | 1.9 |
| George Peabody Coll. | 14 | 211 | 165 | 78.2 | 35 | 16.6 | 8 | 8.8 | — | — | 3 | 1.4 |
| George Washington Univ. | 13 | 42 | 18 | 42.0 | 1 | 2.4 | 92 | 52.3 | 1 | 2.4 | — | 10.6 |
| Georgetown Univ. | 14 | 47 | 22 | 46.9 | 1 | 2.1 | 10 | 40.4 | — | — | 5 | 2.1 |
| Hartford Sem. Foundation | 1 | 48 | 12 | 25.0 | — | — | 35 | 72.3 | — | — | 1 | 1.3 |
| Indiana Univ. | 18 | 158 | 80 | 49.4 | 8 | 5.2 | 25 | 16.3 | 38 | 24.8 | 2 | 5.3 |
| Iowa State Coll. | 14 | 430 | 909 | 68.6 | 1 | — | 204 | 47.4 | 2 | 3.5 | 14 | 4.0 |
| Iowa State Univ. of | 22 | 727 | 491 | 67.3 | 88 | 5.2 | 147 | 20.2 | 22 | 3.0 | 29 | 5.7 |
| Johns Hopkins Univ. | 27 | 592 | 321 | 54.3 | 10 | 1.7 | 209 | 35.3 | 18 | 3.0 | 34 | — |
| Kansas State Coll. | 4 | 7 | 6 | 71.4 | — | — | 2 | 33.6 | — | — | — | — |
| Kansas Univ. of | 15 | 120 | 76 | 63.3 | 2 | 1.7 | 88 | 31.7 | — | — | 4 | 3.3 |
| Kentucky Univ. of | 8 | 48 | 31 | 64.6 | — | 8.3 | 10 | 20.8 | — | — | 3 | 6.3 |
| Lawrence Coll. (Inst. of Paper Chem.) | 1 | 45 | 27 | — | — | — | 46 | 100.0 | — | — | — | — |
| Louisiana State Univ. | 13 | 65 | 41 | 71.3 | 3 | 4.5 | 13 | 19.7 | 2 | 3.0 | 1 | 1.5 |
| Loyola Univ. (Chicago) | 4 | 12 | 8 | 66.7 | 1 | 8.3 | 3 | 25.0 | — | — | — | — |
| Marquette Univ. | 6 | 23 | 16 | 61.6 | 7 | 20.9 | 1 | 3.8 | 2 | 7.7 | — | — |
| Maryland, Univ. of | 14 | 147 | 59 | 40.1 | 1 | .7 | 86 | 58.5 | 1 | 1.7 | — | — |
| Massachusetts Inst. of Tech. | 9 | 246 | 88 | 35.8 | — | — | 148 | 60.2 | 3 | 1.2 | 7 | 2.8 |
| Massachusetts State Coll. | 9 | 40 | 16 | 40.0 | 1 | 2.5 | 20 | 50.0 | 1 | 2.5 | 2 | 5.0 |
| Michigan Coll. of Mining and Tech. | 1 | 2 | 2 | 100.0 | — | — | — | — | — | — | — | — |
| Michigan State Coll. | 9 | 84 | 47 | 56.0 | — | — | 32 | 38.0 | 3 | 3.6 | 2 | 2.4 |
| Michigan, Univ. of | 34 | 1,018 | 625 | 61.4 | 23 | 2.3 | 287 | 28.2 | 42 | 4.1 | 41 | 4.0 |
| Minnesota, Univ. of | 32 | 809 | 481 | 59.4 | 13 | 1.6 | 270 | 33.4 | 11 | 1.4 | 34 | 4.2 |
| Missouri, Univ. of | 22 | 187 | 141 | 75.5 | 10 | 5.3 | 30 | 16.0 | 1 | 1.5 | 5 | 2.7 |
| Nebraska, Univ. of | 24 | 194 | 124 | 63.9 | 9 | 4.6 | 53 | 27.4 | 5 | 2.6 | 3 | 1.5 |
| N. Y. State Coll. of Forestry (Syracuse Univ.) | 1 | 13 | 6 | 46.2 | — | — | 6 | 46.2 | — | — | 1 | 7.6 |
| New York Univ. | 23 | 850 | 446 | 52.5 | 170 | 20.0 | 160 | 18.8 | 46 | 5.4 | 98 | 9.3 |
| Niagara Univ. | 7 | 25 | 15 | 60.0 | 6 | 24.0 | 3 | 12.0 | — | — | 1 | 4.0 |
| North Carolina, Univ. of | 17 | 240 | 171 | 71.2 | 2 | .8 | 51 | 21.3 | 3 | 1.3 | 13 | 5.4 |
| North Dakota, Univ. of | 8 | 16 | 12 | 75.0 | 1 | 6.3 | 2 | 12.4 | 1 | 6.3 | — | — |
| Northwestern Univ. | 27 | 409 | 227 | 55.4 | 18 | 4.4 | 98 | 24.0 | 60 | 14.7 | 6 | 1.5 |
| Noire Dame, Univ. of | 7 | 60 | 24 | 40.0 | 1 | 1.7 | 33 | 55.0 | 2 | 3.3 | — | — |
| Ohio State Univ. | 29 | 937 | 590 | 63.0 | 36 | 3.8 | 250 | 26.7 | 41 | 4.4 | 20 | 2.1 |
| Oklahoma, Univ. of | 5 | 29 | 22 | 75.9 | 2 | 6.9 | 5 | 17.2 | — | — | — | — |
| Oregon State Coll. | 6 | 18 | 8 | 44.4 | — | — | 9 | 50.0 | — | — | 1 | 5.6 |
| Oregon, Univ. of | 10 | 20 | 18 | 90.0 | — | — | 2 | 10.0 | — | — | — | — |
| Pennsylvania State Coll. | 17 | 224 | 106 | 47.3 | 3 | 1.3 | 109 | 48.7 | — | — | 6 | 2.7 |
| Pennsylvania, Univ. of | 23 | 615 | 354 | 57.5 | 62 | 10.1 | 143 | 23.3 | 34 | 5.5 | 92 | 3.6 |
| Pittsburgh, Univ. of | 23 | 401 | 176 | 43.9 | 72 | 18.0 | 110 | 27.4 | 16 | 4.0 | 27 | 6.7 |
| Princeton Univ. | 15 | 477 | 330 | 69.2 | 12 | 2.5 | 121 | 25.4 | 9 | 1.9 | 5 | 1.0 |
| Purdue Univ. | 13 | 137 | 46 | 33.7 | 3 | 2.2 | 78 | 56.9 | 8 | 5.8 | 2 | 1.4 |
| Radcliffe Coll. | 26 | 123 | 74 | 60.1 | 4 | 8.3 | 13 | 10.6 | — | — | 32 | 26.0 |
| Rensselaer Polytechnic Inst. | 4 | 22 | 9 | 40.9 | — | — | 10 | 45.5 | 3 | 13.6 | — | — |

TABLE V—Continued

| Institutions | Number of Departments in Which Degree Was Awarded ^a | Number of Persons Receiving Degree | Status of Degree Holders | | | | | | | | | |
|--------------------------------|--|------------------------------------|----------------------------------|-------|---------------------------------|--------------------------------------|-----|------|---------------------------|-----|-------------------------------------|-----|
| | | | Employed | | | In Nonacademic Pursuits ^d | | | Employment Status Unknown | | Not Gainfully Employed ^e | |
| | | | In Higher Education ^b | | In Other Education ^c | In Nonacademic Pursuits ^d | No. | % | No. | % | No. | % |
| | | | No. | % | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Rice Inst. | 5 | 40 | 22 | 55.0 | — | — | 16 | 40.0 | — | — | 2 | 5.0 |
| Rochester, Univ. of | 12 | 116 | 70 | 60.3 | 1 | — | 39 | 33.6 | 1 | — | 5 | 4.3 |
| Rutgers Univ. | 12 | 93 | 44 | 47.3 | — | — | 45 | 48.4 | 1 | 1.1 | 5 | 3.2 |
| St. John's Univ. | 1 | 8 | — | — | 3 | 100.0 | — | — | — | — | — | — |
| St. Louis Univ. | 18 | 110 | 84 | 76.4 | 7 | 6.4 | 12 | 10.9 | 2 | 1.8 | 5 | 4.5 |
| Smith Coll. | 2 | 2 | 2 | 100.0 | — | — | — | — | — | — | — | — |
| South Carolina, Univ. of | 2 | 6 | 4 | 66.6 | 1 | 16.7 | 1 | 16.7 | — | — | — | — |
| South'n Baptist Theol. Sem. | 1 | 127 | 91 | 71.6 | 2 | 1.6 | 34 | 26.8 | 10 | 7.9 | — | — |
| South'n Calif., Univ. of | 25 | 192 | 111 | 57.8 | 28 | 14.6 | 27 | 14.1 | 10 | 5.2 | 16 | 8.3 |
| Stanford Univ. | 25 | 393 | 258 | 65.7 | 15 | 3.8 | 76 | 19.3 | 35 | 8.9 | 9 | 2.3 |
| Syracuse Univ. | 9 | 57 | 33 | 57.8 | 1 | 1.8 | 18 | 31.6 | — | — | 5 | 8.8 |
| Tennessee, Univ. of | 1 | 3 | 2 | 66.7 | — | — | 1 | 33.3 | — | — | — | — |
| Texas, Univ. of | 15 | 276 | 202 | 73.2 | 9 | 3.3 | 53 | 19.2 | 4 | 1.4 | 8 | 2.9 |
| Tulane Univ. | 8 | 15 | 8 | 53.3 | — | — | 6 | 40.0 | — | — | 1 | 6.7 |
| Union Theol. Sem. | 1 | 28 | 16 | 61.5 | 2 | 7.7 | 8 | 30.8 | 1 | — | — | — |
| Vanderbilt Univ. | 16 | 89 | 67 | 75.4 | 2 | 2.2 | 14 | 15.7 | 1 | 1.1 | 5 | 5.6 |
| Virginia, Univ. of | 15 | 196 | 133 | 67.9 | 1 | — | 58 | 29.6 | 1 | — | 3 | 1.5 |
| Washington, State Coll. of | 7 | 97 | 10 | 10.3 | — | — | 15 | 15.5 | 1 | — | 1 | 1.0 |
| Washington Univ. (St. Louis) | 20 | 109 | 60 | 55.0 | 6 | 5.0 | 34 | 31.2 | 3 | 3.8 | 6 | 5.0 |
| Washington, Univ. of (Seattle) | 22 | 244 | 157 | 64.3 | 12 | 4.9 | 56 | 23.0 | 9 | 3.7 | 10 | 4.1 |
| West Virginia Univ. | 10 | 39 | 21 | 53.9 | — | — | 14 | 35.9 | 2 | 5.1 | 2 | 5.1 |
| Western Reserve Univ. | 17 | 153 | 82 | 53.5 | 17 | 11.1 | 46 | 30.1 | 1 | — | 7 | 4.6 |
| Wisconsin, Univ. of | 34 | 1,928 | 823 | 42.7 | 10 | — | 402 | 21.0 | 46 | 3.5 | 47 | 3.5 |
| Yale Univ. | 41 | 1,187 | 764 | 64.3 | 44 | 3.7 | 287 | 24.2 | 59 | 5.0 | 33 | 2.8 |

ment are the operating units in graduate work, proposals for change must rest ultimately on the situation in each particular institution and in the constituent departments or fields of specialization.

It is suggested that the reader begin his study of Table V by reading the footnote to column 2 which explains why the name and number of departments attributed to a given university may differ from those used locally. The table is easily read and the number of comparisons that can be made is limited primarily by the ingenuity and interest of the reader. He may, for instance, study the table of placement history to see what universities send intellectual workers to institutions of higher education, or his interest may be in preparation for nonacademic pursuits of a public and private nature. An inspection of columns 4 to 9 shows that most institutions cannot take an either-or attitude toward the two major categories of employment. Four fairly distinct patterns of placement are shown and each significantly conditions the feasibility of proposals for changing the program or procedure. Columbia University is representative of institutions in the first pattern, in which enough workers are prepared to justify appropriately designed programs in each of the three categories of employment. The University of Wisconsin is representative of institutions in the second pattern, which differs from the first only by no appreciable effort being made to prepare doctoral students for leadership in other than higher education. George Peabody College and Marquette University are representative of institutions in the third pattern, in which attention is focused on preparing candidates for teaching and related careers in precollegiate and higher education, few graduates of which in other words undertake nonacademic pursuits. And Massachusetts Institute of Technology and American University are representative of institutions in the fourth pattern, in which there is a minor concern for preparing professors or other educators because most of the graduates are placed in private and public nonacademic agencies.

In higher education, the chief field of placement, it may also be observed that 18 institutions so placed above 70 percent of

their graduates, that 64 graduate schools placed 40 to 70 percent of their Ph.D. recipients in this category, and that only 12 institutions placed less than 40 percent of their graduates in the field of higher education. Nevertheless the graduate school can no longer be thought of as merely a place for the advanced education of college personnel. When 6,028 persons, 27 percent of the decade's doctoral output, enter nonacademic careers, it is evident that many graduate schools serve a clientele that is definitely in the workaday world and have an obligation to keep their programs consonant with this fact. As a whole Table V indicates that graduate school placement is bimodally differentiated, and the more detailed analysis of the same data, to be presented in the next chapter, further weakens any assumption that a single pattern of training for the doctorate is equally good for all purposes.

The chief interest of many graduate faculty members is in a factually generalized picture of employment by departments or major fields of study. Table VI provides the elements for such a mosaic. Column 2 permits the inference that factors other than social need entered into the determination of the number of institutions awarding degrees in the 50 departments. In the field of animal husbandry, for instance, where we know the United States Department of Agriculture stimulated some national and regional planning, the award of 215 degrees in the decade was restricted to 11 institutions. But when the usual *laissez faire* policy was followed, as in the field of anatomy, 34 graduate schools were required for the award of 137 degrees. In the newer fields such as home economics, library science, and psychiatry where there is a shortage of Ph.D. personnel, the number of institutions awarding the doctorate ranged from 2 to 9. But in education and older fields like chemistry, English, history, physics, and zoology the number of degree-granting schools ranged from 55 to 74. Furthermore, it appears from a table not here reproduced that institutions that began offering doctoral work during the 1930's tended to do so in overcrowded fields where they had strong undergraduate departments rather than where regional development indicated a need. Over the

TABLE VI

EMPLOYMENT STATUS, AS OF SEPTEMBER 1940, OF LIVING RECIPIENTS OF PH.D. DEGREE, 1930-31 TO 1939-40; BY DEPARTMENTS IN WHICH DEGREE WAS AWARDED

| Departments ^a | Number of Institutions Conferring Degree | Number of Persons Receiving Degree | Status of Degree Holders | | | | | | | | | |
|--------------------------|--|--|-------------------------------------|------|------------------------------------|------|--|------|--------------------------------------|------|---|------|
| | | | Employed | | | | | | Employ- ment Status Unknown | | Not Gain- fully Em- ployed ^c | |
| | | | In Higher Education ^b | | In Other Education ^c | | In Nonaca- demic Pur- suits ^d | | No. | % | No. | % |
| | | | No. | % | No. | % | No. | % | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| All Departments | | 22,509 | 13,516 | 60.1 | 1,239 | 5.5 | 6,028 | 26.8 | 864 | 3.8 | 862 | 3.8 |
| Agriculture | 22 | 289 | 173 | 59.9 | — | — | 103 | 35.6 | 8 | 2.8 | 5 | 1.7 |
| Anatomy | 34 | 137 | 106 | 77.4 | 1 | .7 | 15 | 10.9 | 6 | 4.4 | 9 | 6.6 |
| Animal Hus- bandry | 11 | 215 | 153 | 71.2 | — | — | 57 | 26.5 | 2 | .9 | 3 | 1.4 |
| Anthropology | 11 | 106 | 70 | 66.0 | — | — | 22 | 20.8 | 4 | 3.8 | 10 | 9.4 |
| Art and Archeol. | 18 | 89 | 60 | 67.3 | 3 | 3.4 | 12 | 13.5 | 3 | 3.4 | 11 | 12.4 |
| Astronomy | 12 | 68 | 54 | 79.4 | 1 | 1.5 | 12 | 17.6 | 1 | 1.5 | — | — |
| Bacteriology | 39 | 355 | 192 | 54.0 | 1 | .3 | 132 | 37.2 | 6 | 1.7 | 24 | 6.8 |
| Biochemistry | 37 | 525 | 294 | 56.0 | 1 | .2 | 189 | 36.0 | 9 | 1.7 | 32 | 6.1 |
| Botany | 46 | 946 | 584 | 61.8 | 25 | 2.6 | 264 | 27.9 | 15 | 1.6 | 58 | 6.1 |
| Business Admin. | 10 | 156 | 122 | 78.2 | — | — | 24 | 15.4 | 10 | 6.4 | — | — |
| Chemistry | 74 | 3,889 | 1,331 | 34.2 | 42 | 1.1 | 2,291 | 58.9 | 123 | 3.2 | 102 | 2.6 |
| Classical Studies | 32 | 396 | 288 | 72.7 | 43 | 10.9 | 15 | 3.8 | 21 | 5.3 | 29 | 7.3 |
| Economics | 48 | 845 | 521 | 61.6 | 6 | .7 | 262 | 31.0 | 42 | 5.0 | 14 | 1.7 |
| Education | 55 | 2,713 | 1,573 | 58.0 | 675 | 24.9 | 232 | 10.4 | 107 | 3.9 | 76 | 2.8 |
| Engineering | 24 | 351 | 174 | 49.6 | 1 | .3 | 143 | 40.7 | 30 | 8.5 | 3 | .9 |
| English | 55 | 1,381 | 1,168 | 84.5 | 77 | 5.6 | 40 | 2.9 | 40 | 2.9 | 56 | 4.1 |
| Entomology | 22 | 675 | 156 | 23.1 | 3 | 1.1 | 98 | 14.5 | 5 | 1.8 | 15 | 2.2 |
| Forestry | 11 | 65 | 34 | 52.3 | — | — | 27 | 41.5 | — | — | 4 | 6.2 |
| Genetics | 10 | 73 | 41 | 56.2 | — | — | 29 | 39.7 | — | — | 3 | 4.1 |
| Geography | 15 | 131 | 109 | 83.1 | 3 | 2.3 | 15 | 11.5 | 3 | 2.3 | 1 | .8 |
| Geology | 37 | 460 | 191 | 41.5 | 4 | .9 | 248 | 53.9 | 9 | 2.0 | 8 | 1.7 |
| Germanic Studies | 30 | 285 | 227 | 79.6 | 16 | 5.6 | 9 | 3.2 | 10 | 3.5 | 23 | 8.1 |
| History | 56 | 1,249 | 911 | 72.9 | 91 | 7.3 | 121 | 9.7 | 61 | 4.9 | 65 | 5.2 |
| Home Economics | 8 | 66 | 52 | 78.8 | 2 | 3.0 | 6 | 9.1 | 1 | 1.5 | 5 | 7.6 |
| Horticulture | 17 | 121 | 84 | 69.4 | — | — | 35 | 28.9 | — | — | 2 | 1.7 |
| International Law | 9 | 44 | 23 | 52.3 | — | — | 15 | 34.1 | 4 | 9.1 | 2 | 4.5 |
| Law | 6 | 24 | 13 | 54.1 | 1 | 4.2 | 9 | 37.5 | — | — | 1 | 4.2 |
| Library | 2 | 25 | 20 | 80.0 | — | — | 4 | 16.0 | — | — | 1 | 4.0 |
| Literature (Gen'l) | 12 | 63 | 34 | 54.0 | 6 | 9.5 | 4 | 6.3 | 3 | 4.8 | 16 | 25.4 |
| Mathematics | 49 | 695 | 577 | 83.0 | 28 | 4.0 | 42 | 6.0 | 27 | 4.0 | 21 | 3.0 |
| Med. and Surg. | 15 | 147 | 92 | 62.6 | — | — | 45 | 30.6 | 6 | 4.1 | 4 | 2.7 |
| Metallurgy | 11 | 46 | 15 | 32.6 | — | — | 30 | 65.2 | 1 | 2.2 | — | — |
| Mineralogy | 3 | 5 | 1 | 20.0 | — | — | 4 | 80.0 | — | — | — | — |
| Music | 11 | 81 | 21 | 26.0 | 4 | 12.9 | 3 | 9.7 | 2 | 6.5 | 1 | 3.2 |
| Oriental Studies | 10 | 129 | 88 | 68.2 | 6 | 4.7 | 30 | 23.3 | 6 | 4.7 | 4 | 3.1 |
| Paleontology | 4 | 32 | 21 | 65.6 | 1 | 3.1 | 10 | 31.3 | — | — | 3 | — |
| Pharmacology | 21 | 129 | 77 | 59.7 | 1 | .8 | 43 | 33.3 | 5 | 3.9 | 8 | 2.8 |
| Philosophy | 40 | 377 | 241 | 63.9 | 25 | 6.6 | 70 | 18.6 | 21 | 5.6 | 20 | 5.3 |
| Physics | 54 | 1,127 | 694 | 61.6 | 10 | .9 | 345 | 30.6 | 64 | 5.7 | 14 | 1.2 |
| Physiology | 38 | 271 | 179 | 66.0 | 1 | .4 | 48 | 17.7 | 11 | 4.1 | 32 | 11.8 |
| Political Science | 39 | 445 | 296 | 66.6 | 6 | 1.3 | 104 | 23.4 | 94 | 7.6 | 5 | 1.1 |
| Psychiatry | 4 | 23 | 11 | 47.9 | — | — | 7 | 30.4 | 5 | 21.7 | — | — |
| Psychology | 50 | 940 | 587 | 62.4 | 45 | 4.8 | 208 | 21.9 | 46 | 4.9 | 56 | 6.0 |
| Public Health | 7 | 45 | 21 | 46.7 | — | — | 21 | 46.7 | 2 | 4.4 | 1 | 2.2 |
| Religion | 21 | 552 | 262 | 47.5 | 14 | 2.5 | 243 | 44.0 | 29 | 5.3 | 4 | .7 |
| Romance Studies | 37 | 602 | 469 | 77.8 | 53 | 8.8 | 19 | 3.2 | 25 | 4.2 | 36 | 6.0 |
| Slavic Studies | 2 | 8 | 5 | 62.5 | — | — | 1 | 12.5 | 4 | 50.0 | — | — |
| Social Welfare | 4 | 36 | 20 | 55.6 | — | — | 14 | 38.9 | — | — | 2 | 5.6 |
| Sociology | 36 | 394 | 281 | 71.3 | 4 | 1.0 | 79 | 20.1 | 21 | 5.3 | 9 | 2.3 |
| Zoology | 61 | 1,060 | 781 | 73.7 | 25 | 2.4 | 170 | 16.0 | 21 | 2.0 | 63 | 5.9 |
| Dept. Unknown | — | 73 | 26 | 35.6 | 14 | 19.2 | 13 | 17.8 | 11 | 15.1 | 9 | 12.3 |

^a Institutions do not follow a common definition of a department or field of study. The pattern here used is comparable to that used in the American Council on Education's *American Universities and Colleges* and in the Association of Research Libraries' *Doctoral Dissertations Accepted by American Universities*. Hence the names used are not in all cases identical with those employed by particular institutions; a certain amount of combining of locally recognized departments under a single heading in this table has also been necessary.

^{b,c,d} See Notes a, b, and c, Table IV, for explanation of these categories.

^e See Note e, Table V, for explanation.

years this tendency has produced a concentration which column 3 of Table VI highlights: 51 percent of the degrees were awarded in 6 of the 50 departments. Chemistry and education account for three-fifths and English, history, physics, and zoology for two-fifths of that proportion.

If one is interested in a factual picture of concentration by categories larger than departments, he can combine departmental data by his own definition of what fields belong in a divisional organization. Allowing for the fact, for instance, that one person may place geography with the physical sciences and another with the social sciences, it may be said that approximately 28 percent of the doctoral graduates studied earned their degrees in the physical sciences, 18 percent in the social sciences, 16 percent in the biological sciences, 15 percent in the humanities, and 23 percent in fields that may be characterized as professional and semiprofessional. The latter figure will be especially disturbing to those professors who think of the graduate school as a nonvocational institution of arts and sciences.

Columns 4 to 9 of Table VI make evident the varying degrees of departmental responsibility for the three categories of employment. Education alone, for example, provided more than half of the persons employed in academic work outside of higher education, most of which was precollegiate. It is doubtful if any other department places enough people in this category to make it worthwhile to shape its graduate program to the occupational needs of this type of employment. Experience has shown that in general it is uneconomical to develop work for a broad category of employment unless 10 percent of the enrollment in a major department is interested in it. On the basis of this generalization, column 9 indicates a dozen or so of the 50 departments that probably would not be justified in aiming at the non-academic field, unless they happen to be in an institution catering to this area, such as American University which serves a large federal clientele.

Chemistry and English illustrate the extremes of difference in departmental interest in the categories of employment respectively of nonacademic work and higher education. Chemistry

placed 59 percent of its doctoral graduates in nonacademic careers while English so placed less than 3 percent. Conversely, chemistry placed but 34 percent of its product in all types of higher education as against 85 percent for the field of English. These facts indicate that the subject of specialization is likely to be an important factor in determining the nature of one's future life work, and they suggest that departments should take cognizance of this situation in planning for the common and distinctive needs of the several occupational groups. The matter becomes of increasing importance when a department has sizable proportions of its enrollment in more than one of the major categories, as will be emphasized in the more detailed analysis to be presented in the chapter to follow.

III

Employment Analyzed by Major Duties

FROM A GENERAL overview of the employment status of 22,509 persons who earned the Ph.D. degree during the 1930's, the survey now turns to a more detailed study of the 20,783 members of the group who were listed by their graduate schools as gainfully employed in September 1940. The data are presented from three perspectives: that of the proportion employed in university graduate schools, colleges, junior colleges, other educational agencies, and in public and private nonacademic agencies (see Tables VII, VIII, and IX); that of the number of persons engaged in teaching, research, administration, and other major duties (see Tables X, XI, and XII); and finally a picture (Table XIII) which puts the two together so that the reader can see, for instance, how the persons engaged in college work distribute among the categories of teaching, research, administration, and miscellaneous activities.

In response to lamentations that the field of education seems possessed of a spirit which troubles the waters of the pool of graduate study, the concluding section of this chapter is devoted to a comparison of two doctor's degrees in education. More specifically, the analysis shows the outcome of a decade's effort to exorcise this spirit from the Ph.D. degree in education, or at least to alleviate its untoward effects through the use of the professional degree of doctor of education.

The analyses of this and the preceding chapters are based on assumptions that are not universally accepted and which, therefore, should be explicitly stated. First, they rest squarely on the premise that the primary function of the graduate school at the

doctoral level is to round out the formal education of selected individuals who will undertake or continue in socially significant but diverse scholarly careers. The importance one attaches to such analyses depends on the degree to which he accepts the above view and the further postulate which asserts that a knowledge of the employment status of an occupational group is well-nigh indispensable to its actual and potential members and to those who prepare others to enter it. For such statistical studies to be considered important one must also believe that the 1940 employment situation of the 20,783 persons concerned can be helpful in charting a course for the foreseeable future. A final assumption of those who would use these data to influence practice is that the average recipient of the Ph.D. degree becomes reasonably well settled professionally within ten years, and therefore that the distributions by years of the decade give an essentially true generalized picture of the several stages of employment through which an individual is likely to go.

Faculty groups that subscribe to these assumptions tend to welcome normative data on placement as an important means of gauging program emphases calculated to bring or keep the graduate school abreast of the changing social scene. They tend to believe that a knowledge of the major duties required in the several kinds of employing agency is a powerful and salutary aid in constructing both the common core and the differentiated study required to meet the needs of distinct occupational groups within the same field. For instance, in the field of chemistry there is need for a common core of fundamental study and also for differentiation to fit the needs of those who will teach in high school or the first two years of college as contrasted with those who will teach in graduate schools, or for those who will conduct research for the federal government as contrasted with those who will become chemical engineers for duPont.

For groups likely to use the data of this and the preceding chapters it is necessary to point out some of their limitations and to caution against unwarranted interpretations. To begin with, it should be remembered that the facts on the nature of employment were supplied by graduate school officials whose

knowledge was often, in the nature of the case, derived at second hand. A further limitation lies in the circumstance that each official was asked to decide to the best of his ability how individuals should be classified as belonging *primarily* in each category of employing agency and in each category of major duty. This request, made in the full knowledge that few individuals actually fall exclusively in a single classification (most university professors, for instance, teach at both graduate and undergraduate levels and do some research or administration as well as teaching), proved to be too much of an oversimplification for many graduate school officials. This left the compiler no alternative but to include combination categories for graduate-undergraduate work, teaching-research, teaching-administration, and research-administration. The interpreter must accordingly consolidate the combination categories with the appropriate main ones if he wishes to make departmental and institutional comparisons. A final caution: the percentages in this chapter are based on 20,783 persons gainfully employed, while those of the preceding chapter were based on 22,509 individuals who had earned the Ph.D. degree; therefore they are not strictly comparable.

WHAT AGENCIES EMPLOYED THE PH.D. GRADUATES?

For a variety of reasons alert graduate faculties want to know whether their department or institution places doctoral students in favored types of institution as readily as in the case of other similarly situated graduate schools. Among the better reasons is a desire to use the information in shaping programs of study so as to improve the preparation offered for the major duties normally required of staff members in the college, government bureau, industrial research laboratory, or other agency. Until the present compilation on a national scale and covering a decade there had been very little normative data by which an institution could appraise its situation. There is of course no intent to imply, and it should not be inferred, that an institution ought to adjust its program to these crude statistical aggregates. It would be a misuse of them, for instance, to encourage

American University or George Washington University to desert its socially sound policy of serving the particular needs of government employees in Washington, D.C., in order to be more like the typical graduate school. But when used with due regard for institutional individuality and the bent of departmental leaders, as well as for the present and prospective need for scholarly workers in the region and the more immediate service area, the statistical generalizations presented in this chapter can be helpful in reshaping graduate programs.

From the perspective of employing agencies, Table VII shows the employment status in September 1940 of 20,783 persons who had worked from ten years to only a few months as holders of the Ph.D. degree. A consolidation of the first row of columns 6, 8, 10, and 12 shows 65 percent in higher education, column 14 shows 6 percent in the other agencies of education, and columns 16 and 18 together show 29 percent in government and industry. The proportion in the precollegiate fields was not only fairly stable over the decade but was too small to be of significance in more than a few schools and, therefore, discussion will be delayed until analyses by departments and by institutions are undertaken. The data for higher education and for nonacademic employment each indicate a trend of major social significance. Those who want to modify graduate programs in the direction of greater social utility need to take account of the fact that since Melvin E. Haggerty's sampling study¹ in the territory of the North Central Association in 1927, the proportion of Ph.D. recipients employed in higher education has declined from 80 percent to 65 percent and that practically all of the 15 percent shifted to nonacademic pursuits.

From the discussion to follow in Chapters IV and V, it appears that college and junior college officials and employers from government and industry are in substantial agreement in asking graduate schools to modify their programs in the direction of more basic unspecialized graduate work in broad fields, even at the expense of immediate technical competence for such careers as pathologist, metallurgist, or professor of medieval

¹ *North Central Association Quarterly*, II (June 1927), 108-123.

TABLE VII

TYPES OF EMPLOYMENT, AS OF SEPTEMBER 1940, OF EMPLOYED RECIPIENTS OF PH.D. DEGREE,
1930-31 TO 1939-40; BY YEARS OF DEGREE AWARD

| Year | No. of Institutions Conferring Degree | No. of Persons Receiving Degree | No. of Degree Holders Employed | Types of Employment | | | | | | | | | | Nonacademic Work, Primarily in | | | |
|---------------------------------|--|------------------------------------|-----------------------------------|------------------------------------|------|---------|------|---|-----|-------------------|-----|---|-----|-----------------------------------|------|---------------------|------|
| | | | | Academic Work, Primarily in | | | | | | | | | | | | | |
| | | | | University (Graduate School) | | College | | University and College ^a | | Junior College | | Other Ed- ucational Agencies ^b | | Public Agencies | | Private Agencies | |
| | | | | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Decade 1930-31 to 1939-40 | 94 | 22,509 | 20,783 | 5,178 | 24.9 | 7,232 | 34.8 | 561 | 2.7 | 545 | 2.6 | 1,239 | 6.0 | 1,898 | 9.1 | 4,180 | 19.9 |
| 1930-31 | 74 | 1,010 | 1,765 | 503 | 28.5 | 567 | 32.2 | 37 | 2.1 | 39 | 2.2 | 103 | 5.8 | 198 | 11.2 | 318 | 18.0 |
| 1931-32 | 74 | 2,070 | 1,894 | 527 | 27.8 | 628 | 33.2 | 44 | 2.3 | 48 | 2.5 | 112 | 5.9 | 198 | 10.5 | 937 | 17.8 |
| 1932-33 | 75 | 2,053 | 1,877 | 487 | 25.9 | 625 | 33.3 | 35 | 1.9 | 46 | 2.5 | 116 | 6.2 | 188 | 10.0 | 880 | 20.2 |
| 1933-34 | 78 | 2,290 | 2,088 | 515 | 24.6 | 670 | 32.1 | 46 | 2.2 | 52 | 2.5 | 134 | 6.4 | 221 | 10.6 | 450 | 21.6 |
| 1934-35 | 85 | 2,268 | 2,132 | 566 | 26.5 | 715 | 33.6 | 58 | 2.7 | 50 | 2.3 | 113 | 5.3 | 182 | 8.5 | 448 | 21.1 |
| 1935-36 | 83 | 2,183 | 2,021 | 469 | 23.2 | 741 | 36.7 | 51 | 2.5 | 61 | 3.0 | 131 | 6.5 | 167 | 8.3 | 401 | 19.8 |
| 1936-37 | 86 | 2,324 | 2,149 | 500 | 23.3 | 782 | 36.3 | 66 | 3.1 | 47 | 2.2 | 126 | 5.9 | 164 | 7.6 | 464 | 21.6 |
| 1937-38 | 81 | 2,300 | 2,134 | 538 | 25.2 | 763 | 35.7 | 66 | 3.1 | 64 | 3.0 | 115 | 5.4 | 179 | 8.4 | 409 | 19.2 |
| 1938-39 | 87 | 2,479 | 2,318 | 515 | 22.2 | 900 | 38.8 | 64 | 2.8 | 60 | 2.6 | 144 | 6.2 | 204 | 8.8 | 431 | 18.6 |
| 1939-40 | 84 | 2,632 | 2,405 | 558 | 23.2 | 841 | 35.1 | 94 | 3.9 | 78 | 3.2 | 145 | 6.0 | 197 | 8.2 | 492 | 20.4 |

^a Because of variations in practice in reporting under this heading it is recommended that numbers and percentages given be halved and added appropriately to columns 5, 6, 7, and 8 when annual comparisons are made.

^b Largely precollegiate, but including state departments of education.

history. The need for the new emphasis is certainly great in higher education because three-fifths of those employed are working primarily at the undergraduate level where there is more need for integration and breadth of knowledge than for a high degree of specialization. A cursory look at the employment situation makes it evident that graduate schools are primarily training undergraduate college professors rather than graduate professors for university and professional work.

Perhaps the greatest surprise that comes from a study of Table VII for trends over the decade, is that there is so small a difference in the proportion of the ten classes employed in the three categories for higher education. Most persons would expect the trend in graduate-level employment to be described by a fairly evenly descending curve from 1930-31 but few of them would be prepared for a drop of less than 2 percent between any two classes or a total dip of less than 6 percent during the ten years. Conversely, the initiated would expect an increasing proportion of the younger classes to be employed in undergraduate work but they would anticipate a greater range than from 32 percent of the class of 1930-31 to 35 percent for the class of 1939-40. The situation would not be altered in either case if half of the proportions in the combination university-college category were added. Despite these proportionate trends, an inspection of columns 5, 7, and 9 shows for each year of the decade an unevenly mounting number of Ph.D. graduates employed at both the graduate and undergraduate level. In the case of junior colleges (columns 11 and 12), the actual increase in number employed each year is a better indicator of the growing importance of this field for placement than are the percentage figures which for the decade vary less than 2 percent in range.

The proportion of the decade's Ph.D. recipients employed in nonacademic work in September 1940 was perhaps double that for government and industry in September 1930; however, data for documenting this estimate are not available. An inspection of columns 15-18 of Table VII shows the situation for 1930-31 to 1939-40. In general the younger the class the smaller the proportion of its members in government, the decline between

TABLE VIII
TYPES OF EMPLOYMENT, AS OF SEPTEMBER 1940, OF EMPLOYED RECIPIENTS OF PH.D. DEGREE, 1930-31 TO 1939-40; BY DEPARTMENTS IN WHICH DEGREE WAS AWARDED

| Departments* | Number of Institutions Confering Degree | Number of Persons Receiving Degree | Number of Degree Holders Employed | Types of Employment | | | | | | | | | | | | Nonacademic Work, Primarily in | | | |
|--------------------|---|------------------------------------|-----------------------------------|------------------------------|------|---------|------|-------------------------------------|-----|---|-----|---|------|-------|------|--------------------------------|------|------------------|---|
| | | | | Academic Work, Primarily in | | | | | | Other Educational Agencies ^e | | | | | | Public Agencies | | Private Agencies | |
| | | | | University (Graduate School) | | College | | University and College ^b | | Junior College | | Other Educational Agencies ^e | | | | Public Agencies | | Private Agencies | |
| | | | | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | | |
| All Departments | | 22,509 | 20,783 | 5,178 | 24.9 | 7,232 | 34.8 | 561 | 2.7 | 545 | 2.6 | 1,239 | 6.0 | 1,898 | 9.1 | 4,180 | 19.9 | | |
| Agriculture | 22 | 289 | 276 | 82 | 29.6 | 31 | 29.3 | 9 | 3.3 | 1 | .4 | — | — | 86 | 31.2 | 17 | 6.2 | | |
| Anatomy | 34 | 137 | 122 | 76 | 62.3 | 28 | 23.0 | 2 | 1.6 | — | — | 1 | .8 | 2 | 1.6 | 13 | 10.7 | | |
| Animal Husbandry | 11 | 215 | 210 | 59 | 28.1 | 83 | 39.4 | 10 | 4.8 | 1 | .5 | — | — | 22 | 10.5 | 35 | 16.7 | | |
| Anthropology | 11 | 106 | 92 | 38 | 41.3 | 26 | 28.3 | 5 | 5.4 | 1 | 1.1 | — | — | 16 | 17.4 | 6 | 6.5 | | |
| Art and Archeology | 18 | 89 | 75 | 26 | 34.7 | 31 | 41.3 | 3 | 4.0 | — | — | 3 | 4.0 | 7 | 9.3 | 5 | 6.7 | | |
| Astronomy | 12 | 68 | 67 | 26 | 38.8 | 23 | 34.3 | 5 | 7.5 | — | — | 1 | 1.5 | 7 | 10.4 | 5 | 7.5 | | |
| Bacteriology | 39 | 355 | 325 | 118 | 36.4 | 69 | 21.2 | 5 | 1.5 | — | — | 1 | .3 | 70 | 21.5 | 62 | 19.1 | | |
| Biochemistry | 37 | 525 | 484 | 195 | 40.2 | 36 | 17.3 | 12 | 2.5 | 1 | .2 | 1 | .2 | 40 | 8.3 | 149 | 30.8 | | |
| Botany | 46 | 946 | 873 | 261 | 29.9 | 265 | 30.4 | 41 | 4.7 | 17 | 1.9 | 25 | 2.9 | 193 | 22.1 | 71 | 8.1 | | |
| Business Admin. | 10 | 156 | 146 | 46 | 31.5 | 74 | 50.6 | 1 | .7 | 1 | .7 | — | — | 9 | 6.2 | 15 | 10.3 | | |
| Chemistry | 74 | 8,889 | 8,064 | 518 | 14.1 | 702 | 19.2 | 61 | 1.7 | 50 | 1.4 | 42 | 1.1 | 213 | 5.8 | 2,078 | 56.7 | | |
| Classical Studies | 32 | 393 | 346 | 69 | 19.9 | 191 | 55.3 | 8 | 2.3 | 20 | 5.8 | 43 | 12.4 | — | — | 15 | 4.3 | | |
| Economics | 48 | 845 | 739 | 241 | 30.5 | 236 | 29.3 | 36 | 4.6 | 8 | 1.0 | 6 | .8 | 193 | 24.5 | 69 | 8.7 | | |
| Education | 55 | 2,713 | 2,650 | 446 | 17.6 | 1,004 | 39.6 | 23 | 3.9 | 100 | 4.0 | 675 | 26.7 | 143 | 5.7 | 139 | 5.5 | | |
| Engineering | 24 | 351 | 318 | 163 | 32.4 | 63 | 19.8 | 5 | 1.6 | 3 | .9 | 1 | .3 | 20 | 6.3 | 133 | 38.7 | | |
| English | 55 | 1,381 | 1,285 | 367 | 28.6 | 697 | 54.2 | 49 | 3.8 | 55 | 4.3 | 77 | 6.0 | 10 | .8 | 30 | 9.3 | | |
| Entomology | 22 | 275 | 255 | 100 | 36.2 | 48 | 18.8 | 5 | 2.0 | 3 | 1.2 | 3 | 1.2 | 58 | 22.7 | 38 | 14.9 | | |
| Forestry | 11 | 65 | 61 | 17 | 27.9 | 16 | 26.2 | 1 | 1.6 | — | — | — | — | 18 | 29.5 | 9 | 14.8 | | |
| Genetics | 10 | 73 | 70 | 21 | 30.1 | 19 | 27.1 | — | — | 1 | 1.4 | — | — | 22 | 31.1 | 7 | 10.0 | | |
| Geography | 15 | 131 | 127 | 41 | 32.3 | 65 | 51.1 | 2 | 1.6 | 1 | .8 | 3 | 2.4 | 11 | 8.7 | 4 | 3.1 | | |

| | | | | | | | | | | | | | | | | | |
|----------------------|----|-------|-------|-----|------|-----|------|----|-----|----|-----|----|------|-----|------|-----|------|
| Geology | 87 | 460 | 443 | 90 | 20.3 | 88 | 19.4 | 9 | 2.0 | 6 | 1.4 | 4 | 9 | 97 | 21.9 | 151 | 34.1 |
| Germanic Studies | 30 | 285 | 252 | 62 | 24.6 | 136 | 54.0 | 21 | 8.3 | 8 | 3.2 | 16 | 6.3 | 4 | 1.6 | 5 | 2.0 |
| History | 56 | 1,249 | 1,123 | 232 | 20.7 | 564 | 50.2 | 30 | 2.7 | 85 | 7.6 | 91 | 8.1 | 71 | 6.3 | 50 | 4.4 |
| Home Economics | 8 | 66 | 60 | 14 | 23.3 | 37 | 61.7 | 1 | 1.7 | 1 | — | 2 | 3.3 | 4 | 6.7 | 2 | 3.3 |
| Horticulture | 17 | 121 | 119 | 44 | 37.0 | 30 | 25.1 | 9 | 7.6 | 1 | .8 | — | — | 31 | 26.1 | 4 | 3.4 |
| International Law | 9 | 44 | 38 | 3 | 7.9 | 16 | 42.2 | 1 | 2.6 | 3 | 7.9 | — | — | 11 | 23.9 | 4 | 10.5 |
| Law | 6 | 24 | 23 | 2 | 8.7 | 10 | 43.6 | 1 | 4.3 | — | — | 1 | 4.3 | 5 | 21.7 | 4 | 17.3 |
| Library | 2 | 25 | 24 | 12 | 50.0 | 8 | 33.3 | — | — | — | — | — | — | 3 | 12.5 | 1 | 4.2 |
| Literature (General) | 12 | 63 | 44 | 16 | 36.4 | 16 | 36.4 | 1 | 2.3 | 1 | 2.3 | 6 | 13.5 | — | — | 4 | 9.1 |
| Mathematics | 49 | 695 | 647 | 174 | 26.9 | 361 | 55.8 | 19 | 2.9 | 23 | 3.6 | 28 | 4.3 | 15 | 2.3 | 27 | 4.2 |
| Medicine and Surgery | 15 | 147 | 137 | 72 | 52.6 | 20 | 14.6 | — | — | — | — | — | — | 11 | 8.0 | 34 | 24.8 |
| Metalurgy | 11 | 46 | 45 | 8 | 17.7 | 7 | 15.6 | — | — | — | — | — | — | 3 | 6.7 | 27 | 60.0 |
| Mineralogy | 3 | 5 | 5 | — | — | 1 | 20.0 | — | — | — | — | — | — | 1 | 20.0 | 3 | 80.0 |
| Music | 11 | 31 | 28 | 6 | 31.4 | 13 | 46.4 | 1 | 3.6 | 1 | 3.6 | 4 | 14.3 | 2 | 7.1 | 1 | 3.6 |
| Oriental Studies | 10 | 129 | 119 | 44 | 37.0 | 30 | 25.2 | 7 | 5.9 | 2 | 1.7 | 6 | 6.0 | 5 | 4.2 | 25 | 21.0 |
| Paleontology | 4 | 32 | 32 | 10 | 31.3 | 10 | 31.3 | — | — | 1 | 3.1 | 1 | 3.1 | 3 | 9.4 | 7 | 21.8 |
| Pharmacology | 21 | 129 | 121 | 57 | 47.2 | 19 | 15.7 | 1 | .8 | — | — | 1 | .8 | 12 | 9.9 | 31 | 25.6 |
| Philosophy | 40 | 377 | 336 | 77 | 22.3 | 135 | 40.2 | 14 | 4.2 | 15 | 4.5 | 25 | 7.4 | 19 | 5.7 | 51 | 15.2 |
| Physics | 54 | 1,127 | 1,049 | 233 | 34.1 | 333 | 36.5 | 33 | 3.1 | 25 | 2.4 | 10 | 1.0 | 34 | 8.0 | 261 | 24.9 |
| Physiology | 33 | 271 | 228 | 129 | 56.5 | 42 | 18.4 | 4 | 1.8 | 4 | 1.8 | 1 | .4 | 12 | 5.3 | 36 | 15.3 |
| Political Science | 39 | 445 | 406 | 103 | 26.6 | 162 | 39.9 | 19 | 4.7 | 7 | 1.7 | 6 | 1.5 | 62 | 15.3 | 42 | 10.3 |
| Psychiatry | 4 | 23 | 18 | 9 | 50.0 | 2 | 11.1 | — | — | — | — | — | — | 3 | 16.7 | 4 | 22.2 |
| Psychology | 50 | 940 | 838 | 221 | 26.5 | 332 | 39.6 | 18 | 2.1 | 16 | 1.9 | 45 | 5.4 | 111 | 13.2 | 95 | 11.3 |
| Public Health | 7 | 45 | 42 | 11 | 26.2 | 10 | 23.8 | — | — | — | — | — | — | 14 | 33.3 | 7 | 16.7 |
| Religion | 21 | 552 | 519 | 92 | 17.7 | 158 | 30.4 | 4 | .8 | 8 | 1.5 | 14 | 2.7 | 7 | 1.3 | 236 | 45.6 |
| Romance Studies | 37 | 602 | 541 | 146 | 27.0 | 277 | 51.2 | 24 | 4.4 | 22 | 4.1 | 53 | 9.8 | 7 | 1.3 | 12 | 2.2 |
| Slavic Studies | 2 | 8 | 4 | 2 | 50.0 | 1 | 25.0 | — | — | — | — | — | — | — | — | 1 | 25.0 |
| Social Welfare | 2 | 36 | 34 | 14 | 41.2 | 6 | 17.6 | — | — | — | — | — | — | 2 | 5.9 | 12 | 35.3 |
| Sociology | 36 | 394 | 364 | 104 | 23.6 | 148 | 40.7 | 22 | 6.0 | 7 | 1.9 | 4 | 1.1 | 45 | 12.4 | 34 | 9.3 |
| Zoology | 61 | 1,060 | 976 | 305 | 31.2 | 391 | 40.1 | 39 | 4.0 | 46 | 4.7 | 25 | 2.6 | 110 | 11.3 | 60 | 6.1 |
| Department Unknown | — | 73 | 53 | 11 | 20.8 | 14 | 26.4 | — | — | 1 | 1.9 | 14 | 26.4 | 4 | 7.5 | 9 | 17.0 |

^a See Note a, Table VI.

^b Because of variations in practice in reporting under this heading it is recommended that numbers and percentages given be halved and added appropriately to columns 5, 6, 7, and 8 when departmental comparisons are to be made.

^c Largely precollegiate, but including state departments of education.

the first and the last year of the decade being 3 percent. Since more of the classes of the depression years were still in government in 1940 than entered the area from the postdepression classes, it may be that the trend shown is due to this economic upheaval rather than to the period elapsing since degrees were awarded. The slight upward trend in the proportion employed in industry and other private agencies suggests a tendency for increasing proportions of later graduating classes to be employed in private pursuits. Cognizance must certainly be taken of these trends by persons who would keep graduate education close to the growing edge of American culture. Moreover, the impetus which the second world war has given to the employment of Ph.D. graduates in government is almost certain to reverse the downward trend shown for the proportions employed in public nonacademic agencies.

From a picture of employment in terms of the year in which degrees were earned, Table VIII directs attention to how each of 50 departments or major fields distributed its graduates of the decade among the several types of employing agency. As a preliminary to studying the table it may be helpful for the reader to review the general comments made on a similar table in Chapter II. A cursory study of columns 11 to 14 of Table VIII indicates that placement in, and presumably training for both the junior colleges and the "other educational agencies" is a distinctly marginal interest for all departments except education. This department provided nearly a fifth of the Ph.D. graduates entering the former and more than half of those entering the latter field. Together these persons constitute 31 percent of those receiving the degree in education. Only six other departments placed more than 10 percent of their doctoral graduates in the two fields together: classical studies (next to education with 18 percent), music, history, romance studies, philosophy, and English. There is reason to suspect that in most cases leaders of these departments and the individuals concerned regarded such placement as a matter of last resort—this is even more probably true with respect to departments still less implicated. There are, however, many indications that the second

world war will greatly accelerate the development of the already rapidly growing junior college movement. It should become an increasingly important field of placement for institutions willing to shape Ph.D. programs for greater social usefulness in general education, an area of major concern in junior colleges and in at least the first two years of most four-year colleges.

A comparison of placement figures for the departments of chemistry and English illustrates the contrasts in departmental responsibility for preparing personnel for the six types of agency for which distributions are shown in Table VIII. Chemistry placed 36 percent of its Ph.D.'s in all types of higher education as compared with 91 percent for English, 1 percent in other educational agencies as compared to 6 percent for English, and 63 percent in nonacademic pursuits as compared with 3 percent for English. It is evident that most chemistry departments have a considerable responsibility for preparing scholarly personnel for both academic and nonacademic fields while the responsibility of English is predominantly to higher education.

The relative emphasis of the two departments within the area of higher education is shown by the fact that chemistry placed 15 percent of the decade's Ph.D. recipients in graduate school positions in contrast to 31 percent for English; the corresponding figures for undergraduate positions, including junior colleges, was 21 percent for chemistry and 60 percent for English. In arriving at these figures the combination category was added in equal proportions to the graduate and the undergraduate categories. These figures give graduate professors of English twice as strong a mandate for shaping Ph.D. programs to prepare candidates to work effectively as undergraduate professors of liberal or general education, as for continuing the prevailing practice of educating the candidate as if he were destined to become a graduate research professor of English.

Industrial research laboratories of private corporations employed practically all of the 57 percent of the Ph.D. graduates in chemistry listed in private nonacademic employment in September 1940; government and other public agencies employed 6 percent of the decade's output. It should be noted that the

figures for chemistry cover chemical engineers and all other types of chemist except biochemists. Biochemistry was considered numerically important enough to justify a separate departmental listing, and both the number and differentiation of work in chemical engineering will perhaps soon justify similar treatment. As is true with all relatively new fields, biochemistry placed a large proportion of its Ph.D. recipients, 40 percent, in graduate professorships.

Many graduate departments distributed their scholarly product fairly evenly among the several types of academic and non-academic agency instead of showing patterns in the fashion noted for chemistry and English. Except as basic work is common to all occupational groups, this situation makes adaptations to the needs of particular agencies difficult for such departments as animal husbandry, economics, forestry, political science, and physics. In some institutions these and similarly situated departments declare that the issue does not exist and that all of their offerings are equally fundamental to diverse occupational groups regardless of whether the main function of the employing agency is teaching, productive research, or the applications of research. Some universities go to the other extreme and tailor courses to suit the needs of a specific dominant occupational group. All others, including students who take the courses in support of a specialization outside the department, are then expected to reorient the work and apply the principles to fields scarcely touched upon by the instructor. Examples will come to the mind of anyone who has helped a graduate student plan his program of studies; others can find specific illustration by asking those responsible for Ph.D. programs in agriculture, biology, or mechanical engineering about the difficulty of getting suitable graduate courses for candidates who are not specializing in a small area of a department.

Table VIII is also helpful for getting a factual picture of how the departments compare in the proportion of Ph.D. graduates in the several levels of academic work. It will be noted that the new and replacement needs at the graduate level are proportionately much less for the older academic fields, especially in the

humanities. In general the newer the field the more likely it is to place a large proportion of its people in graduate-level employment. In keeping with this principle of demand most of the supply of doctors in the older academic fields find employment, approximately in the order named, in colleges of liberal arts, teachers colleges, undergraduate technical and professional colleges, and junior colleges. But the demand for Ph.D. holders in these types of institution is actually growing at the reverse order of intensity despite the fact that as yet no graduate school consciously prepares candidates for work in junior college. This changing employment situation seems to call for a modification of training programs by departments that heretofore have been most reluctant to prepare candidates for any careers other than university teaching and productive research.

Graduate school officials were able to supply data which permitted a somewhat more detailed analysis of the employment status of 7,394 persons or 36 percent of the 20,783 gainfully employed Ph.D. graduates. This sample was fortuitously rather than systematically selected, depending on local records, and is heavily weighted in favor of the nonacademic occupations. Usable data were supplied in this way on three groups: on 96 percent of the decade's Ph.D. graduates in private nonacademic agencies, on 85 percent of the group in similar work under government auspices, and on 1,376 persons placed in teachers colleges—or 19 percent of the total college group. In this last category 76 individuals were described as being in work not consonant with the area or level of their doctoral training. Further analysis shows that the teachers colleges received 66 percent of the decade's doctoral graduates in education, 68 percent of those in English, and 51 percent of those in history. Since the departmental figures for the whole sample and for the entire group of 20,783 do not differ from one another by more than two or three points, it may be assumed that the sample is reasonably representative and consequently that the teachers colleges draw on these departments to a relatively disproportionate extent. At the other end of the scale, among the newer and highly specialized departments in the sample studied, 9 had no repre-

sentative at all in a teachers college and 14 placed but one or two graduates each in such institutions.

As already noted, similar and quantitatively more adequate data are available on 1,615 of the 1,898 recipients of the Ph.D. degree who were listed in September 1940 as employed in government agencies. Of these 1,207 were in federal employ, 291 in state agencies, and 117 with local governments. Approximately 1 percent of the federal group were in positions incompatible with their training, as compared with 5 percent for the state employees and 10 percent for those in local agencies. Back reference to columns 15 and 16 of Table VIII will supply the number and proportion trained by each of the 50 departments, as far as the whole undifferentiated group is concerned. In the sample, except for psychology and education, most departments hovered around the group average of 75 percent in federal employment, 18 percent with state governments, and 7 percent in local agencies of this character. The proportions for the two deviating departments were roughly 40 percent in federal positions, 40 percent in state employment, and 20 percent in the agencies of local government—a situation accounted for by their preponderant responsibility for service in educational, corrective, and welfare institutions operated by state and local governments.

The sample is most complete with respect to the 4,130 persons engaged in nonacademic work under private auspices. Of the 3,982 individuals of this category for whom detailed information was supplied, 1,239 or 31 percent were in occupations outside of industrial and commercial research. More specifically, 388 of them were private consultants, 368 were clergymen and missionaries, 318 were private health and welfare workers, 96 were engaged in wholesale and retail trade (34 of whom were grossly misemployed), 29 were lawyers, 27 bankers and brokers, and 15 were employed by insurance companies. Those engaged in industrial and commercial research were distributed as follows: chemical and allied industries 1,089; petroleum industries 513; food products 256; iron, steel, and metal products 181; electrical industries 113; stone, clay, and glass products 126;

TABLE IX
TYPES OF EMPLOYMENT, AS OF SEPTEMBER 1940, OF EMPLOYED RECIPIENTS OF PH.D. DEGREE, 1930-31 TO 1939-40;
BY INSTITUTIONS CONFERRING DEGREE

| Institutions | Number of Departments in Which Degree Was Award- ed ^a | Number of Persons Receiv- ing Degree | Number of Degree Holders Em- ployed | Types of Employment | | | | | | | | | | | | Nonacademic Work, Primarily in | |
|---------------------------------------|--|--|---|------------------------------------|------|---------|-------|---|------|---|------|---|------|--------------------|------|-----------------------------------|------|
| | | | | Academic Work, Primarily in | | | | | | Other Ed- ucational Agencies ^c | | | | | | | |
| | | | | University (Graduate School) | | College | | University and College ^b | | Junior College | | Other Ed- ucational Agencies ^c | | Public Agencies | | Private Agencies | |
| | | | | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| I | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| All Institutions | | 22,509 | 20,783 | 5,178 | 24.9 | 7,232 | 34.8 | 561 | 2.7 | 545 | 2.6 | 1,239 | 6.0 | 1,898 | 9.1 | 4,130 | 19.9 |
| American Univ. | 19 | 73 | 68 | 6 | 8.8 | 7 | 10.3 | — | — | — | — | 2 | 2.9 | 45 | 66.2 | 8 | 11.8 |
| Arizona Univ. | 3 | 16 | 16 | 2 | 12.5 | 3 | 18.7 | 1 | 6.3 | 1 | 6.3 | — | — | 6 | 37.5 | 3 | 18.7 |
| Boston Coll. | 7 | 58 | 56 | — | — | 17 | 30.4 | — | — | — | — | 35 | 62.4 | 1 | 1.8 | 3 | 5.4 |
| Boston Univ. | 12 | 113 | 95 | 26 | 27.4 | 36 | 37.8 | 1 | 1.1 | 5 | 5.3 | 7 | 7.4 | 2 | 2.1 | 18 | 18.9 |
| Brookings Inst. | 1 | 18 | 16 | 3 | 20.0 | 1 | 6.7 | — | — | — | — | — | — | 6 | 40.0 | 6 | 33.3 |
| Brooklyn Polytechnic Inst. of | 2 | 15 | 13 | 1 | 7.7 | 1 | 7.7 | — | — | — | — | — | — | — | — | 10 | 76.9 |
| Brown Univ. | 19 | 164 | 156 | 22 | 14.1 | 73 | 46.9 | — | — | 3 | 1.9 | 3 | 1.9 | 10 | 6.4 | 45 | 28.8 |
| Bryn Mawr Coll. | 16 | 95 | 75 | 4 | 5.3 | 48 | 64.0 | — | — | 1 | 1.3 | 9 | 12.0 | 5 | 6.7 | 8 | 10.7 |
| Buffalo, Univ. of | 4 | 12 | 10 | 2 | 20.0 | 1 | 10.0 | — | — | — | — | — | — | — | — | 7 | 70.0 |
| California Inst. of Tech. | 7 | 185 | 189 | 34 | 24.5 | 49 | 35.3 | — | — | 3 | 2.2 | — | — | 7 | 5.0 | 46 | 33.0 |
| California, Univ. of (Berkeley) | 36 | 950 | 859 | 304 | 35.4 | 175 | 20.4 | 103 | 12.0 | 47 | 5.5 | 20 | 2.3 | 94 | 10.9 | 116 | 13.5 |
| California, Univ. of (Los Angeles) | 3 | 5 | 5 | 1 | 20.0 | 2 | 40.0 | — | — | 1 | 20.0 | — | — | 1 | 20.0 | 13 | 48.2 |
| Carnegie Inst. of Tech. | 3 | 27 | 27 | 5 | 18.5 | 7 | 25.9 | — | — | — | — | — | — | 2 | 7.4 | 30 | 8.4 |
| Catholic Univ. of America | 22 | 369 | 356 | 3 | 3.8 | 197 | 55.4 | 19 | 5.3 | 65 | 18.3 | 37 | 10.4 | 5 | 1.4 | — | — |
| Chicago, Univ. of | 36 | 1,671 | 1,571 | 378 | 24.1 | 707 | 45.0 | 32 | 2.0 | 45 | 2.9 | 44 | 2.8 | 120 | 7.6 | 245 | 15.6 |
| Cincinnati, Univ. of | 16 | 143 | 126 | 47 | 37.3 | 19 | 15.1 | 1 | 1.8 | 2 | 1.6 | 2 | 1.6 | 5 | 4.0 | 50 | 39.6 |
| Claremont Colls. | 1 | 1 | 1 | — | — | — | 100.0 | — | — | — | — | — | — | — | — | — | — |
| Clark Univ. | 8 | 84 | 75 | 15 | 20.0 | 34 | 45.3 | 5 | 6.7 | 2 | 2.7 | 4 | 5.3 | 5 | 6.7 | 10 | 13.3 |
| Colorado State Coll. of Ed. | 1 | 80 | 27 | — | — | 12 | 44.5 | — | — | 5 | 18.5 | 6 | 22.2 | 2 | 7.4 | 2 | 7.4 |
| Colorado, Univ. of | 16 | 107 | 93 | 20 | 21.5 | 34 | 36.5 | 2 | 2.2 | 4 | 4.3 | — | — | 10 | 10.8 | 23 | 24.7 |

^a See Note a, Table V.

^b Because of variations in practice in reporting under this heading, it is recommended that numbers and percentages given be halved and added appropriately to figures in columns 5, 6, 7, and 8 when institutional comparisons are to be made.

^c Largely precollegiate, but including state departments of education.

TABLE IX—Continued

| Institutions | Number of Departments in Which Degree Was Awarded ^a | Number of Persons Receiving Degree | Number of Degree Holders Employed | Types of Employment | | | | | | | | | | Nonacademic Work, Primarily in | | | |
|---------------------------------------|--|------------------------------------|-----------------------------------|------------------------------|------|---------|-------|-------------------------------------|------|----------------|------|---|------|--------------------------------|------|------------------|-------|
| | | | | Academic Work, Primarily in | | | | | | | | | | | | | |
| | | | | University (Graduate School) | | College | | University and College ^b | | Junior College | | Other Educational Agencies ^c | | Public Agencies | | Private Agencies | |
| | | | | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Columbia Univ. | 20 | 1,851 | 1,675 | 821 | 19.2 | 695 | 41.4 | 25 | 1.5 | 34 | 2.0 | 232 | 13.8 | 99 | 5.9 | 279 | 16.7 |
| Cornell Univ. | 30 | 1,971 | 1,163 | 882 | 32.9 | 855 | 30.5 | 25 | 9.1 | 23 | 2.0 | 31 | 2.0 | 153 | 13.2 | 171 | 14.4 |
| Drew Univ. | 1 | 33 | 9 | 9 | 27.3 | 2 | 6.1 | 1 | 3.0 | 3 | 9.1 | 6 | 3.0 | — | — | 17 | 51.5 |
| Dropsie Coll. | 4 | 22 | 20 | — | — | 2 | 5.0 | — | — | 2 | 10.0 | 3 | 30.0 | — | — | 11 | 55.0 |
| Duke Univ. | 26 | 230 | 218 | 26 | 11.9 | 106 | 48.6 | 33 | 15.1 | 1 | — | 3 | 1.4 | 27 | 12.4 | 22 | 10.1 |
| Duquesne Univ. | 4 | 5 | 2 | 1 | 60.0 | — | — | — | — | — | — | — | — | — | — | 1 | 50.0 |
| Florida, Univ. of | 3 | 23 | 27 | — | — | 12 | 44.5 | 1 | 3.7 | — | — | — | — | 3 | 11.1 | 11 | 40.7 |
| Fordham Univ. | 80 | 207 | 197 | 18 | 9.1 | 71 | 36.0 | — | — | 2 | 1.0 | 83 | 42.2 | 1 | — | 22 | 11.2 |
| George Peabody Coll. | 14 | 211 | 208 | 37 | 17.8 | 123 | 61.5 | — | — | — | — | 35 | 16.8 | 6 | 2.9 | 2 | 1.0 |
| George Washington Univ. | 13 | 42 | 41 | 17 | 41.6 | 1 | 2.4 | — | — | — | — | 1 | 2.4 | 16 | 39.0 | 6 | 14.6 |
| Georgetown Univ. | 14 | 47 | 42 | 14 | 33.3 | 7 | 16.7 | 1 | 2.4 | — | — | 1 | 2.4 | 15 | 35.7 | 4 | 9.5 |
| Harford Sem. Found'n | 1 | 48 | 47 | 4 | 8.5 | 7 | 14.9 | — | — | 1 | 2.1 | — | — | — | — | 35 | 74.5 |
| Indiana Univ. | 13 | 133 | 115 | 43 | 16.3 | 68 | 31.3 | 1 | — | 3 | 2.7 | 8 | 7.1 | 7 | 6.2 | 18 | 15.9 |
| Iowa State Coll. | 14 | 420 | 414 | 53 | 12.6 | 191 | 45.6 | 13 | 3.1 | 14 | 3.4 | 1 | — | 89 | 16.7 | 135 | 32.6 |
| Iowa State Univ. of Science and Arts | 24 | 729 | 670 | 92 | 17.8 | 331 | 49.0 | 25 | 3.7 | 14 | 2.0 | 83 | 5.6 | 43 | 10.7 | 100 | 14.5 |
| Johns Hopkins Univ. | 27 | 592 | 540 | 163 | 50.1 | 143 | 26.5 | 9 | 1.7 | 16 | 1.1 | 10 | 1.9 | 63 | 12.0 | 141 | 26.1 |
| Kansas State Coll. | 4 | 120 | 7 | 1 | 14.3 | 4 | 67.1 | — | — | — | — | — | — | 2 | 23.6 | — | — |
| Kansas, Univ. of | 15 | 116 | 116 | 24 | 20.7 | 46 | 39.7 | — | — | 6 | 5.2 | 12 | 1.7 | 13 | 15.5 | 20 | 17.2 |
| Kentucky Univ. of Law and Medicine | 8 | 48 | 45 | 5 | 11.1 | 25 | 55.5 | 1 | 2.2 | — | — | 4 | 8.0 | 7 | 15.6 | 3 | 6.7 |
| Kentucky Coll. (Inst. of Paper Chem.) | 1 | 45 | 45 | — | — | — | — | — | — | — | — | — | — | — | — | 45 | 100.0 |
| Louisiana State Univ. | 13 | 60 | 63 | 26 | 41.2 | 18 | 28.5 | — | — | 3 | 4.8 | 3 | 4.8 | 3 | 4.8 | 10 | 15.9 |
| Loyola Univ. (Chicago) | 4 | 12 | 12 | 1 | 8.3 | 5 | 41.7 | — | — | 2 | 16.7 | 1 | 8.3 | — | — | 3 | 25.0 |
| Marquette Univ. | 9 | 26 | 24 | 4 | 16.7 | 10 | 41.6 | 1 | 4.2 | 2 | 4.2 | 7 | 29.1 | — | — | 1 | 4.2 |
| Maryland, Univ. of | 14 | 147 | 146 | 37 | 25.3 | 12 | 8.2 | 8 | 5.5 | 2 | 1.4 | 1 | — | 61 | 41.8 | 25 | 17.1 |
| Massachusetts Inst. of Tech. | 9 | 246 | 236 | 41 | 17.4 | 43 | 18.2 | 2 | .8 | 2 | .8 | 1 | — | 14 | 5.9 | 134 | 56.9 |
| Massachusetts State Coll. | 9 | 40 | 37 | 5 | 13.5 | 11 | 29.7 | — | — | — | — | 1 | 2.7 | 9 | 24.4 | 11 | 29.7 |
| Michigan Coll. of Mining and Tech. | 1 | 2 | 2 | — | — | 2 | 100.0 | — | — | — | — | — | — | — | — | — | — |
| Michigan State Coll. | 9 | 84 | 79 | 12 | 15.1 | 30 | 38.0 | 5 | 6.8 | — | — | — | — | 16 | 20.3 | 16 | 20.3 |
| Michigan, Univ. of | 34 | 1,018 | 935 | 359 | 36.2 | 251 | 26.8 | 25 | 2.7 | 10 | 1.1 | 23 | 2.5 | 92 | 9.8 | 195 | 20.9 |
| Minnesota, Univ. of | 32 | 809 | 764 | 256 | 36.9 | 201 | 26.4 | 37 | 4.8 | 7 | .9 | 13 | 1.7 | 104 | 13.6 | 166 | 21.7 |
| Missouri, Univ. of | 22 | 187 | 181 | 45 | 24.9 | 68 | 37.6 | 18 | 9.9 | 10 | 5.5 | 10 | 5.5 | 11 | 6.1 | 19 | 10.5 |
| Nebraska, Univ. of | 24 | 194 | 186 | 51 | 27.4 | 68 | 36.6 | 3 | 1.6 | 2 | 1.1 | 9 | 4.8 | 12 | 6.5 | 41 | 22.0 |

| | | | | | | | | | | | | | | | | | |
|--|----|-------|-------|-----|------|------|------|----|-----|---|------|-----|----|-------|------|-----|------|
| N. Y. State Coll. of Forestry (Syracuse Univ.) | 1 | 13 | 12 | 3 | 25.0 | 2 | 16.7 | 1 | 8.3 | — | 2.7 | 170 | — | 21.9 | 25.0 | 3 | 25.0 |
| New York Univ. | 28 | 860 | 776 | 101 | 19.0 | 323 | 41.7 | 1 | 1 | — | 29.2 | 6 | 6 | 25.0 | 7.1 | 105 | 13.5 |
| Niagara Univ. | 7 | 25 | 24 | 6 | 25.0 | 2 | 8.3 | — | 9.4 | — | 4.9 | 2 | 13 | 8.0 | — | 93 | 14.7 |
| North Carolina, Univ. of | 17 | 240 | 224 | 40 | 17.9 | 99 | 44.2 | 21 | — | — | 6.7 | 6 | 6 | 6.7 | — | 2 | 13.3 |
| North Dakota, Univ. of | 8 | 16 | 15 | 3 | 20.0 | 8 | 53.3 | — | — | — | 6.7 | 18 | 18 | 6.7 | 4.7 | 82 | 23.9 |
| Northwestern Univ. | 27 | 409 | 343 | 107 | 31.2 | 104 | 30.3 | 4 | 1.2 | — | 3.5 | 1 | 1 | 1.7 | 1.7 | 32 | 55.2 |
| Notre Dame, Univ. of | 7 | 60 | 58 | 7 | 12.1 | 17 | 29.3 | — | — | — | — | 86 | 86 | 4.1 | 7.3 | 186 | 21.2 |
| Ohio State Univ. | 29 | 697 | 876 | 821 | 36.7 | 245 | 38.0 | 16 | 1.8 | — | — | — | — | — | — | — | — |
| Oklahoma, Univ. of | 5 | 29 | 29 | 5 | 17.2 | 15 | 51.8 | — | — | — | 6.9 | 2 | 2 | 6.9 | 6.9 | 3 | 10.3 |
| Oregon State Coll. | 6 | 13 | 17 | 2 | 11.8 | 2 | 60.0 | 1 | 5.9 | — | — | — | — | — | 8.3 | 3 | 17.6 |
| Oregon Univ. of Sci. & Arts | 17 | 20 | 20 | 6 | 30.1 | 76 | 34.8 | 8 | — | — | 10.0 | — | — | — | 10.9 | 9 | 16.1 |
| Pennsylvania State Coll. | 17 | 924 | 918 | 92 | 10.1 | 76 | 34.8 | 8 | 3.7 | — | — | — | — | — | 10.9 | 94 | 43.1 |
| Pennsylvania State Univ. | 23 | 615 | 559 | 145 | 25.9 | 195 | 34.9 | 4 | 1.1 | — | 1.8 | 10 | 10 | 11.1 | 59 | 88 | 15.0 |
| Pittsburgh Univ. of | 23 | 401 | 358 | 54 | 112 | 31.3 | 4 | 4 | 1.1 | — | 1.7 | 72 | 72 | 20.1 | 6.1 | 84 | 24.6 |
| Pittsburgh Univ. | 23 | 477 | 463 | 117 | 25.3 | 201 | 43.4 | 7 | 1.5 | — | 1.1 | 5 | 5 | 2.6 | 6.7 | 90 | 19.4 |
| Purdue Univ. | 13 | 137 | 127 | 21 | 16.5 | 25 | 19.7 | — | — | — | — | 3 | 3 | 2.4 | 10.7 | 68 | 55.5 |
| Randolph Coll. | 25 | 123 | 91 | 10 | 11.0 | 68 | 63.7 | — | — | — | 6.6 | 4 | 4 | 4.4 | 8.8 | 5 | 5.5 |
| Rensselaer Polytechnic Inst. | 4 | 22 | 19 | 2 | 10.5 | 7 | 36.8 | — | — | — | — | — | — | — | — | 10 | 52.7 |
| Rice Inst. | 5 | 40 | 38 | — | — | 21 | 55.3 | — | — | — | 2.6 | — | — | — | 2.6 | 15 | 39.5 |
| Rochester, Univ. of | 12 | 116 | 110 | 38 | 34.5 | 32 | 34.7 | — | — | — | — | 1 | 1 | — | 2.1 | 10 | 30.4 |
| Rutgers Univ. | 12 | 35 | 89 | 12 | 13.5 | 31 | 34.8 | — | — | — | 1.1 | — | — | — | 16.9 | 30 | 33.7 |
| St. John's Univ. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| St. Joseph Univ. | 1 | 3 | 3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| St. Louis Univ. | 18 | 110 | 103 | 40 | 38.8 | 42 | 40.9 | — | — | — | 1.9 | 7 | 3 | 100.0 | 2.9 | 9 | 8.7 |
| Smith Coll. | 2 | 2 | 2 | 1 | 50.0 | 1 | 50.0 | — | — | — | — | — | — | — | — | — | — |
| South Carolina, Univ. of | 2 | 6 | 6 | 4 | 66.6 | — | — | — | — | — | — | — | — | — | — | 1 | 10.7 |
| South'n Baptist Theol. Sem. | 1 | 127 | 117 | 10 | 8.5 | 20 | 17.1 | 1 | .9 | — | — | — | — | — | — | 84 | 71.8 |
| South'n California, Univ. of | 25 | 192 | 166 | 23 | 13.9 | 92 | 37.2 | 4 | 2.4 | — | 13.3 | 28 | 28 | 16.9 | 7.2 | 15 | 9.0 |
| Stanford Univ. | 25 | 393 | 349 | 111 | 31.8 | 110 | 31.5 | 6 | 1.7 | — | 8.9 | 15 | 15 | 4.3 | 5.4 | 57 | 16.4 |
| Syracuse Univ. | 9 | 57 | 52 | 13 | 25.0 | 16 | 30.8 | 1 | 1.9 | — | 5.8 | 1 | 1 | 1.9 | 11.5 | 12 | 23.1 |
| Tennessee, Univ. of | 1 | 276 | 264 | 47 | 17.8 | 129 | 43.8 | 10 | 3.8 | — | 6.1 | 9 | 9 | 3.4 | 4.9 | 40 | 15.2 |
| Texas, Univ. of | 15 | 2 | 2 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Texas, Univ. of | 8 | 15 | 14 | 5 | 21.4 | 5 | 35.7 | — | — | — | — | — | — | — | 23.6 | 2 | 14.3 |
| Union Theol. Sem. | 1 | 26 | 26 | 7 | 26.9 | 9 | 34.6 | — | — | — | — | 2 | 2 | 7.7 | — | 8 | 30.8 |
| Vanderbilt Univ. | 16 | 89 | 83 | 16 | 19.3 | 38 | 45.9 | 6 | 7.2 | — | 8.4 | — | — | — | 9.6 | 6 | 7.2 |
| Virginia, Univ. of | 15 | 196 | 192 | 43 | 22.4 | 76 | 39.5 | 13 | 6.8 | — | .5 | 1 | 1 | 2.4 | 6.3 | 46 | 24.0 |
| Washington, State Coll. of | 7 | 27 | 25 | 3 | 12.0 | 7 | 38.0 | — | — | — | — | — | — | — | — | 8 | 28.0 |
| Washington Univ. (St. Louis) | 20 | 109 | 100 | 40 | 40.0 | 19 | 19.0 | — | — | — | 1.0 | 6 | 6 | 6.0 | 7.0 | 27 | 27.0 |
| Washington, Univ. of (Seattle) | 22 | 244 | 225 | 56 | 24.9 | 73 | 32.4 | 17 | 7.6 | — | 4.9 | 12 | 12 | 5.3 | 9.8 | 34 | 15.1 |
| West Virginia Univ. | 10 | 39 | 35 | 7 | 20.0 | 9 | 25.7 | 3 | 8.6 | — | 5.7 | — | — | — | 14.3 | 9 | 25.7 |
| Western Kentucky Univ. | 17 | 153 | 145 | 24 | 16.6 | 65 | 37.9 | 19 | 1.5 | — | 2.1 | 17 | 17 | 11.7 | 4.8 | 39 | 20.9 |
| Western, Univ. of | 34 | 1,353 | 1,235 | 442 | 35.9 | 359 | 37.4 | 19 | 1.5 | — | 2.3 | 10 | 10 | .8 | 12.2 | 251 | 30.3 |
| Yale Univ. | 41 | 1,137 | 1,095 | 380 | 34.7 | 360 | 32.9 | 16 | 1.5 | — | .7 | 44 | 44 | 4.0 | 8.8 | 191 | 17.4 |

public utilities 101; rubber 95; paper and allied products 75; publishing and printing 75; textile industries 48; mining 43; and forest products 26. The department of chemistry, which includes chemical engineering, supplied approximately half of all the industrial research personnel. Physics and geology were next in importance in providing private industry with scholarly technicians.

Table IX shows the proportion of each institution's doctoral graduates of the decade who were employed in the six types of institution or agency. It does not require aid for easy reading nor are interpretations necessary. The reader can compare the distribution of his own institution with that of any other university or group of universities. He should, however, be cautioned to remember that the officials of each institution were the sole judges of whether a candidate's work was primarily in one or another of the six categories.

WHAT WERE THE MAJOR DUTIES OF THE PH.D. GRADUATES?

The chief functions ordinarily performed by recipients of the Ph.D. degree provide another meaningful scheme for the analysis of employment status. In helping an institution or an individual to shape a graduate program, it is as important to know the primary nature of employment as it is to know the kind of agency in which it is performed. It was for this reason that university officials were also asked to estimate whether their doctoral graduates were engaged *primarily* in teaching, research, or administration. This seemed to be a much harder decision for them to make than the one placing individuals in a particular type and level of institution, as is evidenced by the fact that nearly 11 percent were placed in the combination categories of teaching and research, teaching and administration, and research and administration. As the footnote to columns 17 and 18 of Table X indicates, "other" was used as a catch-all category for miscellaneous types of duty not classifiable as either teaching, research, or administration.

In addition to providing an over-all factual picture of employment by the primary type of duty performed, Table X docu-

TABLE X

TYPES OF DUTY BEING PRIMARILY PERFORMED, AS OF SEPTEMBER 1940, BY EMPLOYED RECIPIENTS OF PH.D. DEGREE, 1930-31 TO 1939-40; BY YEARS OF DEGREE AWARD

| Year | No. of Institutions Conferring Degree | No. of Persons Receiving Degree | No. of Degree Holders Employed | Types of Duty | | | | | | | | | | | | | |
|------------------------------|--|------------------------------------|-----------------------------------|---------------|------|----------|------|---------------------|------|-----------------------------|-----|-------------------------------------|-----|-------------------------------------|-----|--------------------|-----|
| | | | | Teaching | | Research | | Adminis- tration | | Teaching and Research | | Teaching and Admin- istration | | Research and Admin- istration | | Other ^a | |
| | | | | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Decade 1930-31 1939-40 | 94 | 22,509 | 20,783 | 10,497 | 50.5 | 5,500 | 26.5 | 1,741 | 8.4 | 1,546 | 7.4 | 447 | 2.2 | 280 | 1.3 | 772 | 3.7 |
| 1930-31 | 74 | 1,910 | 1,765 | 898 | 50.9 | 405 | 22.9 | 180 | 10.2 | 118 | 6.7 | 65 | 3.7 | 27 | 1.5 | 72 | 4.1 |
| 1931-32 | 74 | 2,070 | 1,894 | 984 | 52.0 | 423 | 22.2 | 204 | 10.8 | 126 | 6.7 | 59 | 3.1 | 38 | 2.0 | 60 | 3.2 |
| 1932-33 | 75 | 2,053 | 1,877 | 921 | 49.0 | 447 | 23.8 | 206 | 11.0 | 142 | 7.6 | 49 | 2.6 | 33 | 1.8 | 79 | 4.2 |
| 1933-34 | 78 | 2,290 | 2,088 | 1,000 | 47.8 | 538 | 25.8 | 217 | 10.4 | 158 | 7.6 | 47 | 2.3 | 34 | 1.6 | 94 | 4.5 |
| 1934-35 | 85 | 2,268 | 2,132 | 1,068 | 50.1 | 550 | 25.7 | 170 | 8.0 | 179 | 8.4 | 44 | 2.1 | 42 | 2.0 | 79 | 3.7 |
| 1935-36 | 83 | 2,183 | 2,021 | 1,054 | 52.3 | 530 | 26.2 | 144 | 7.1 | 150 | 7.4 | 39 | 1.9 | 29 | 1.4 | 75 | 3.7 |
| 1936-37 | 86 | 2,324 | 2,149 | 1,087 | 50.6 | 571 | 26.6 | 169 | 7.9 | 168 | 7.8 | 46 | 2.1 | 19 | .9 | 89 | 4.1 |
| 1937-38 | 81 | 2,300 | 2,134 | 1,124 | 52.7 | 555 | 26.0 | 144 | 6.7 | 168 | 7.9 | 35 | 1.6 | 19 | .9 | 89 | 4.2 |
| 1938-39 | 87 | 2,479 | 2,318 | 1,181 | 50.9 | 684 | 29.6 | 162 | 7.0 | 157 | 6.8 | 38 | 1.6 | 17 | .7 | 79 | 3.4 |
| 1939-40 | 84 | 2,632 | 2,405 | 1,180 | 49.2 | 797 | 33.1 | 145 | 6.0 | 180 | 7.5 | 25 | 1.0 | 22 | .9 | 56 | 2.3 |

^a Includes sales, welfare, promotion, and all other types of duty not properly classifiable as teaching, research, and administration.

TABLE XI

TYPES OF DUTY BEING PRIMARILY PERFORMED, AS OF SEPTEMBER 1940, BY EMPLOYED RECIPIENTS OF PH.D. DEGREE, 1930-31 TO 1939-40, BY DEPARTMENTS IN WHICH DEGREE WAS AWARDED

| Departments ^a | Number of Institutions Con-fering Degree | Number of Persons Receiving Degree | Number of Degree Holders Em-ployed | Types of Duty | | | | | | | | | | Other ^c | | | |
|--------------------------|--|------------------------------------|------------------------------------|---------------|------|----------|------|-----------------|------|------------------------------------|------|---|------|--------------------|-----|-----|-----|
| | | | | Teaching | | Research | | Adminis-tration | | Teaching and Research ^b | | Teaching and Admini-stration ^b | | | | | |
| | | | | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18— |
| All Departments | | 22,509 | 20,788 | 10,497 | 50.5 | 5,500 | 26.5 | 1,741 | 8.4 | 1,546 | 7.4 | 447 | 2.2 | 280 | 1.3 | 772 | 3.7 |
| Agriculture | 22 | 280 | 276 | 60 | 21.7 | 134 | 48.6 | 20 | 7.2 | 46 | 16.7 | 3 | 1.1 | 10 | 3.6 | 3 | 1.1 |
| Anatomy | 34 | 137 | 122 | 62 | 50.9 | 12 | 9.8 | 6 | 4.9 | 32 | 26.2 | 2 | 1.6 | 8 | 6.6 | 8 | 6.6 |
| Animal Husbandry | 11 | 215 | 210 | 40 | 19.0 | 72 | 34.4 | 16 | 7.6 | 62 | 29.5 | 6 | 2.9 | 3 | 1.4 | 11 | 5.2 |
| Anthropology | 11 | 106 | 92 | 39 | 42.4 | 27 | 29.3 | 3 | 3.3 | 17 | 18.5 | 2 | 2.2 | 4 | 4.3 | — | — |
| Art and Archeology | 18 | 89 | 75 | 51 | 68.0 | 10 | 13.3 | 7 | 9.3 | 2 | 2.7 | 2 | 2.7 | — | — | 3 | 4.0 |
| Astronomy | 12 | 68 | 67 | 32 | 47.7 | 23 | 41.8 | 1 | 1.5 | 4 | 6.0 | — | — | — | — | 2 | 3.0 |
| Bacteriology | 39 | 355 | 325 | 93 | 28.6 | 145 | 44.7 | 6 | 1.8 | 59 | 18.2 | 4 | 1.2 | 5 | 1.5 | 13 | 4.0 |
| Biochemistry | 37 | 525 | 484 | 98 | 19.9 | 277 | 57.3 | 7 | 1.4 | 79 | 16.3 | 1 | — | 5 | 1.0 | 19 | 3.9 |
| Botany | 46 | 946 | 873 | 356 | 40.3 | 347 | 39.7 | 34 | 3.9 | 105 | 12.0 | 7 | — | 12 | 1.4 | 12 | 1.4 |
| Business Administration | 10 | 156 | 146 | 86 | 68.9 | 12 | 8.2 | 12 | 8.2 | 14 | 9.6 | 16 | 11.0 | 4 | 2.7 | 2 | 1.4 |
| Chemistry | 74 | 3,889 | 3,664 | 957 | 26.1 | 2,278 | 62.1 | 66 | 1.8 | 182 | 5.0 | 24 | 7 | 116 | 8.2 | 41 | 1.1 |
| Classical Studies | 32 | 396 | 346 | 295 | 85.2 | 11 | 3.2 | 10 | 2.9 | 10 | 2.9 | 8 | 2.3 | — | — | 12 | 3.5 |
| Economics | 43 | 845 | 789 | 412 | 52.2 | 183 | 23.2 | 66 | 8.4 | 71 | 9.0 | 16 | 2.0 | 19 | 2.4 | 22 | 2.8 |
| Education | 55 | 2,713 | 2,530 | 1,387 | 54.9 | 155 | 6.1 | 848 | 33.5 | 8 | 3 | 61 | 2.4 | 4 | 2 | 67 | 2.6 |
| Engineering | 24 | 351 | 318 | 136 | 42.8 | 124 | 39.0 | 16 | 5.0 | 19 | 6.0 | 9 | 2.8 | 6 | 1.9 | 8 | 2.5 |
| English | 55 | 1,381 | 1,265 | 1,070 | 83.3 | 21 | 1.6 | 35 | 2.7 | 87 | 6.8 | 48 | 3.7 | 2 | 2 | 22 | 1.7 |
| Entomology | 22 | 275 | 255 | 89 | 34.9 | 120 | 47.1 | 8 | 3.1 | 20 | 7.8 | 3 | 1.2 | 2 | 3.8 | 13 | 5.1 |
| Forestry | 11 | 65 | 61 | 26 | 42.5 | 23 | 37.7 | 2 | 3.3 | 4 | 6.6 | 4 | 6.6 | 2 | 3.3 | — | — |
| Genetics | 10 | 73 | 70 | 16 | 22.9 | 30 | 42.9 | 5 | 7.1 | 15 | 21.4 | 1 | 1.4 | 3 | 4.3 | — | — |
| Geography | 15 | 131 | 127 | 88 | 69.3 | 12 | 9.4 | 2 | 1.6 | 19 | 15.0 | 4 | 3.1 | 1 | 3.8 | 1 | .8 |

| | | | | | | | | | | | | | | | | | |
|----------------------|----|-------|-------|-----|------|-----|------|-----|------|-----|------|----|------|----|-----|-----|------|
| Geology | 37 | 460 | 443 | 142 | 32.1 | 218 | 49.1 | 19 | 4.3 | 35 | 7.9 | 6 | 1.4 | 10 | 2.3 | 13 | 2.9 |
| Germanic Studies | 30 | 285 | 252 | 920 | 87.2 | 2 | 8 | 7 | 2.8 | 10 | 4.0 | 9 | 3.6 | — | — | 4 | 1.6 |
| History | 56 | 1,249 | 1,123 | 890 | 79.4 | 51 | 4.5 | 81 | 7.2 | 24 | 2.1 | 33 | 2.9 | 8 | 7 | 36 | 3.2 |
| Home Economics | 8 | 66 | 60 | 39 | 65.0 | 5 | 8.3 | 8 | 13.3 | 4 | 6.7 | 2 | 3.3 | 1 | 1.7 | 1 | 1.7 |
| Horticulture | 17 | 121 | 119 | 19 | 16.0 | 58 | 48.7 | 4 | 3.4 | 33 | 27.7 | 2 | 1.7 | 1 | .8 | 2 | 1.7 |
| International Law | 9 | 44 | 38 | 19 | 50.0 | 7 | 16.4 | 7 | 18.4 | — | — | 1 | 2.6 | — | — | 4 | 10.6 |
| Law | 6 | 24 | 23 | 14 | 60.9 | 4 | 17.4 | 2 | 8.7 | — | — | — | — | — | — | 3 | 13.0 |
| Library | 2 | 25 | 24 | 6 | 25.0 | 1 | 4.2 | 16 | 68.6 | — | — | — | — | — | — | 1 | 4.2 |
| Literature (General) | 12 | 63 | 44 | 29 | 65.9 | 2 | 4.6 | 2 | 4.6 | 7 | 15.9 | 2 | 4.5 | — | — | 2 | 4.5 |
| Mathematics | 49 | 695 | 647 | 551 | 85.1 | 36 | 5.6 | 12 | 1.9 | 25 | 3.9 | 10 | 1.5 | 2 | .3 | 11 | 1.7 |
| Medicine and Surgery | 15 | 147 | 137 | 42 | 30.5 | 33 | 24.1 | 2 | 1.5 | 36 | 26.3 | 3 | 2.2 | — | — | 21 | 15.3 |
| Metalurgy | 11 | 46 | 45 | 13 | 23.9 | 24 | 53.4 | 5 | 11.1 | 1 | 2.2 | — | — | — | — | 2 | 4.4 |
| Mineralogy | 3 | 5 | 5 | 1 | 20.0 | 4 | 80.0 | — | — | — | — | — | — | — | — | — | — |
| Music | 11 | 31 | 28 | 20 | 71.5 | 1 | 3.6 | — | 10.7 | 2 | 7.1 | 2 | 7.1 | — | — | — | — |
| Oriental Studies | 10 | 129 | 119 | 48 | 40.3 | 32 | 26.9 | 11 | 9.2 | 14 | 11.8 | 4 | 3.4 | — | — | 10 | 8.4 |
| Paleontology | 4 | 32 | 32 | 17 | 53.1 | 13 | 40.7 | 1 | 3.1 | — | — | — | — | — | — | 1 | 3.1 |
| Pharmacology | 21 | 120 | 121 | 34 | 23.1 | 37 | 39.5 | 4 | 3.3 | 29 | 24.0 | 6 | 5.0 | 8 | 6.6 | 3 | 2.5 |
| Philosophy | 40 | 377 | 336 | 230 | 68.4 | 17 | 5.1 | 42 | 12.5 | 3 | 9 | 7 | 2.1 | — | — | 37 | 11.0 |
| Physics | 54 | 1,127 | 1,049 | 511 | 45.7 | 397 | 37.8 | 13 | 1.7 | 84 | 8.0 | 23 | 2.2 | 7 | .7 | 9 | .9 |
| Physiology | 38 | 271 | 228 | 87 | 33.2 | 60 | 26.3 | 6 | 2.6 | 47 | 20.6 | 2 | .9 | 3 | 1.3 | 23 | 10.1 |
| Political Science | 39 | 445 | 408 | 242 | 59.6 | 50 | 12.3 | 47 | 11.6 | 34 | 8.4 | 6 | 1.5 | 5 | 1.2 | 22 | 5.4 |
| Psychiatry | 4 | 23 | 18 | 1 | 5.8 | 5 | 27.7 | 1 | 5.6 | 5 | 27.7 | 1 | 5.6 | — | — | 5 | 27.8 |
| Psychology | 50 | 940 | 838 | 409 | 43.7 | 160 | 19.1 | 107 | 12.8 | 88 | 10.5 | 25 | 3.0 | 14 | 1.7 | 35 | 4.2 |
| Public Health | 7 | 45 | 42 | 15 | 35.8 | 7 | 16.7 | 8 | 19.0 | 2 | 4.8 | 3 | 7.1 | 3 | 7.1 | 4 | 9.5 |
| Religion | 21 | 552 | 519 | 218 | 42.1 | 8 | 1.5 | 49 | 9.4 | 9 | 1.7 | 16 | 3.1 | — | — | 219 | 42.2 |
| Romance Studies | 37 | 602 | 541 | 462 | 85.4 | 5 | .9 | 11 | 2.0 | 35 | 6.5 | 19 | 3.5 | 1 | .2 | 8 | 1.5 |
| Slavic Studies | 2 | 8 | 4 | 2 | 50.0 | 1 | 25.0 | — | — | — | — | — | — | — | — | 1 | 25.0 |
| Social Welfare | 4 | 36 | 34 | 12 | 35.4 | 1 | 2.9 | 10 | 29.4 | 1 | 2.9 | 6 | 17.6 | — | — | 4 | 11.8 |
| Sociology | 36 | 394 | 364 | 217 | 59.7 | 34 | 9.3 | 43 | 11.8 | 39 | 10.7 | 14 | 3.8 | 5 | 1.4 | 12 | 3.3 |
| Zoology | 61 | 1,060 | 976 | 569 | 53.3 | 200 | 20.5 | 27 | 2.8 | 124 | 12.7 | 23 | 2.4 | 14 | 1.4 | 19 | 1.9 |
| Department Unknown | — | 73 | 53 | 27 | 50.9 | 6 | 11.3 | 18 | 34.0 | — | — | 1 | 1.9 | — | — | 1 | 1.9 |

^a See Note a, Table VI.

^b Because of variations in practice in reporting under these headings it is recommended that numbers and percentages given be halved and added appropriately to columns 5, 6, 7, 8, 9, and 10 when departmental comparisons are to be made.

^c See Note a, Table X, for explanation.

ments a lack of change in the proportion of early and late classes of the decade that found employment in teaching, research, and administration. To get the approximate totals for each of the three categories the reader must cut the Gordian knot the graduate school officials could not cut; it is suggested that he add to each of the three major categories one-half of the data from the two relevant combination categories. Such consolidation places 55 percent of the decade's doctors of philosophy as primarily engaged in teaching, 31 percent as engaged in research, and 10 percent with administration as a major duty. Later tables indicate a wide variation of institutional and departmental responsibility for these totals, and a final table shows the proportion of each category working in graduate schools, colleges, junior colleges, other educational institutions, and in nonacademic agencies.

The slight and chance variations in the proportions of each year's doctoral graduates who engaged primarily in teaching, research, or administration can be seen in detail through an inspection of columns 6, 8, and 10 of Table X. The trends shown there are not changed by adding the relevant data from the combination categories. A horizontal line would describe the situation for teaching, a curve which rises slowly but regularly each year of the decade would describe the trend in research, and a slightly more rapidly descending curve would describe the decrease in the proportion of younger classes employed primarily in administrative work. In other words a class whether ten years or a few months away from graduation places a similar proportion of its people in teaching, but the younger a class the more persons it has in research and, conversely, the older a class the more people it has in administration. The effects of the depression on these generalizations are shown by the distributions for 1930-31 to 1932-33.

Table XI documents the fact that the field of specialization is an important determiner of the primary duty likely to be performed by the prospective doctor of philosophy. After combining with each of the three major categories one-half of the percentages from the two relevant combination categories, the

TYPES OF DUTY BEING PRIMARILY PERFORMED, AS OF SEPTEMBER 1940, BY EMPLOYED RECIPIENTS OF PH.D. DEGREE, 1930-51 TO 1939-40; BY INSTITUTIONS CONFERRING DEGREE

TABLE XII

| Institutions | No. of Departments in Which Degree Was Awarded ^a | Number of Persons Receiving Degree | Number of Degree Holders Employed | Types of Duty | | | | | | | | | | | | Other ^c | |
|------------------------------------|---|------------------------------------|-----------------------------------|---------------|-------|----------|------|------------------|------|------------------------------------|------|--|-----|--|------|--------------------|------|
| | | | | Teaching | | Research | | Adminis- tration | | Teaching and Research ^b | | Teaching and Admin- istration ^b | | Research and Admin- istration ^b | | | |
| | | | | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | | | | | | | | | | | | | | | | | |
| All Institutions | | 22,509 | 20,733 | 10,497 | 50.5 | 5,500 | 26.5 | 1,741 | 8.4 | 1,546 | 7.4 | 447 | 2.2 | 980 | 1.3 | 772 | 3.7 |
| American Univ. | 19 | 73 | 68 | 15 | 22.1 | 23 | 33.8 | 24 | 35.3 | — | — | 1 | 1.5 | 2 | 2.9 | 3 | 4.4 |
| Arizona, Univ. of | 3 | 16 | 16 | 6 | 37.4 | 5 | 31.2 | 2 | 12.5 | 1 | 6.3 | — | — | 1 | 6.3 | 1 | 6.3 |
| Boston Coll. | 7 | 53 | 56 | 45 | 80.3 | 2 | 3.6 | 7 | 12.5 | — | — | — | — | — | — | 2 | 3.6 |
| Brown Univ. | 12 | 113 | 95 | 69 | 72.6 | 6 | 5.3 | 5 | 5.3 | — | — | 1 | 1.1 | — | — | 14 | 14.7 |
| Brookings Inst. | 1 | 18 | 15 | 3 | 20.0 | 8 | 53.4 | 2 | 13.3 | — | — | — | — | — | — | 2 | 13.3 |
| Brooklyn Polytechnic Inst. of | 2 | 15 | 13 | 2 | 15.4 | 9 | 69.2 | 2 | 15.4 | — | — | — | — | — | — | — | — |
| Brown Univ. | 19 | 164 | 156 | 83 | 55.4 | 57 | 36.5 | 4 | 2.6 | — | — | — | — | — | — | 7 | 4.5 |
| Bryn Mawr Coll. | 16 | 95 | 75 | 55 | 73.4 | 10 | 13.3 | 8 | 10.7 | — | — | 1 | 1.3 | — | — | 1 | 1.3 |
| Buffalo, Univ. of | 4 | 12 | 10 | 3 | 30.0 | 4 | 40.0 | 1 | 10.0 | — | — | — | — | 2 | 20.0 | — | — |
| California Inst. of Tech. | 7 | 135 | 139 | 64 | 46.0 | 60 | 43.1 | 3 | 2.2 | 8 | 5.8 | 1 | .7 | — | — | 3 | 2.2 |
| California, Univ. of (Berkeley) | 36 | 950 | 859 | 540 | 52.9 | 267 | 31.1 | 48 | 5.6 | 1 | .1 | — | — | — | — | 3 | .3 |
| California, Univ. of (Los Angeles) | 3 | 5 | 5 | 4 | 80.0 | — | — | — | — | 1 | 20.0 | — | — | — | — | — | — |
| Carnegie Inst. of Tech. | 3 | 27 | 27 | 8 | 29.6 | 13 | 48.2 | 6 | 22.2 | — | — | — | — | — | — | — | — |
| Catholic Univ. of America | 22 | 369 | 356 | 303 | 85.1 | 6 | 1.7 | 23 | 6.5 | 3 | .8 | 4 | 1.1 | 1 | .3 | 16 | 4.5 |
| Chicago, Univ. of | 36 | 1,649 | 1,571 | 1,002 | 63.8 | 325 | 20.7 | 141 | 9.0 | 9 | .6 | 21 | 1.3 | — | — | 73 | 4.6 |
| Cincinnati, Univ. of | 16 | 143 | 136 | 30 | 25.3 | 51 | 40.5 | 10 | 7.9 | 25 | 19.8 | 5 | 4.0 | — | — | 5 | 4.0 |
| Clemson Colls. | 1 | 1 | 1 | 1 | 100.0 | — | — | — | — | — | — | — | — | — | — | — | — |
| Clark Univ. | 8 | 84 | 75 | 53 | 70.7 | 9 | 12.0 | 4 | 5.3 | 6 | 8.0 | — | — | — | — | 3 | 4.0 |
| Colorado State Coll. of Ed. | 1 | 30 | 27 | 11 | 40.7 | 1 | 3.7 | 12 | 44.5 | — | — | — | — | — | — | 3 | 11.1 |
| Colorado, Univ. of | 16 | 107 | 93 | 43 | 46.2 | 23 | 30.1 | 5 | 5.4 | 12 | 12.9 | 1 | 1.1 | 1 | 1.1 | 3 | 3.2 |

^a See Note a, Table V.

^b Because of variations in practice in reporting under these headings it is recommended that numbers and percentages be halved and added appropriately to columns 5, 6, 7, 8, 9, and 10 when institutional comparisons are to be made.

^c See Note a, Table X, for explanation.

TABLE XII—Continued

| Institutions | No. of Departments in Which Degree Was Awarded ^a | Number of Persons Receiving Degrees | Number of Degree Holders Employed | Types of Duty | | | | | | | | | | | | Other ^a | |
|--|---|-------------------------------------|-----------------------------------|---------------|-------|----------|-------|----------------|------|------------------------------------|------|--|-----|--|-----|--------------------|------|
| | | | | Teaching | | Research | | Administration | | Teaching and Research ^b | | Teaching and Administration ^b | | Research and Administration ^b | | | |
| | | | | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| | | | | | | | | | | | | | | | | | |
| 1 | 2 | 8 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Columbia Univ. | 29 | 1,851 | 1,675 | 813 | 43.6 | 330 | 19.7 | 267 | 15.9 | 148 | 8.8 | 36 | 2.1 | 28 | 1.7 | 53 | 3.2 |
| Cornell Univ. | 30 | 1,271 | 1,163 | 471 | 40.5 | 502 | 31.1 | 66 | 5.7 | 190 | 16.3 | 21 | 1.8 | 21 | 1.8 | 32 | 2.8 |
| Dartmouth Univ. | 1 | 22 | 22 | 15 | 68.2 | — | — | 2 | 9.1 | — | — | — | — | — | — | 15 | 45.5 |
| Drexel Coll. | 16 | 23 | 23 | 15 | 65.0 | — | — | 2 | 8.7 | — | — | — | — | — | — | 6 | 30.0 |
| Duke Univ. | 26 | 230 | 218 | 149 | 68.2 | 52 | 23.9 | 13 | 6.0 | 1 | .5 | — | — | — | — | 3 | 1.4 |
| Duquesne Univ. | 4 | 5 | 5 | 1 | 20.0 | — | — | — | — | — | — | — | — | — | — | 1 | 50.0 |
| Florida, Univ. of | 3 | 28 | 27 | 9 | 32.3 | 13 | 48.2 | 2 | 7.4 | 2 | 7.4 | — | — | — | — | 1 | 3.7 |
| Fordham Univ. | 30 | 207 | 197 | 136 | 66.0 | 9 | 4.6 | 43 | 24.4 | 2 | 1.0 | — | — | — | — | 4 | 2.0 |
| George Peabody Coll. | 14 | 211 | 208 | 146 | 70.2 | — | — | 60 | 28.8 | — | — | 1 | .5 | — | — | 1 | .5 |
| George Washington Univ. | 13 | 42 | 41 | 16 | 38.0 | 19 | 46.4 | 3 | 7.3 | — | — | — | — | 3 | 7.3 | — | — |
| Georgetown Univ. | 14 | 47 | 42 | 18 | 42.8 | 10 | 23.8 | 5 | 11.9 | 1 | 2.4 | 1 | 2.4 | — | — | 7 | 10.7 |
| Harford Sem. Found'n | 1 | 48 | 47 | 9 | 18.1 | 1 | 2.1 | 3 | 6.4 | — | — | — | — | — | — | 34 | 72.4 |
| Indiana Univ. | 18 | 123 | 113 | 78 | 63.0 | 13 | 11.5 | 8 | 7.0 | — | — | 1 | .9 | — | — | 13 | 11.5 |
| Iowa State Coll. | 14 | 430 | 414 | 147 | 34.2 | 184 | 44.5 | 23 | 6.0 | 24 | 5.8 | 5 | 1.2 | 13 | 3.1 | 16 | 3.9 |
| Iowa, State Univ. of | 22 | 327 | 276 | 169 | 51.7 | 139 | 48.3 | 33 | 12.3 | 51 | 15.5 | 91 | 4.6 | 2 | .3 | 11 | 1.6 |
| Johns Hopkins Univ. | 27 | 592 | 560 | 289 | 50.3 | 267 | 47.7 | 29 | 5.2 | 3 | .5 | 1 | .2 | — | — | 15 | 2.8 |
| Kansas State Coll. | 4 | 7 | 7 | 3 | 42.9 | 3 | 42.9 | — | — | — | — | — | — | — | — | — | — |
| Kansas, Univ. of | 15 | 120 | 116 | 69 | 59.4 | 35 | 30.2 | 9 | 7.8 | 1 | 14.2 | 2 | 4.4 | — | — | 3 | 2.6 |
| Kentucky, Univ. of | 8 | 43 | 43 | 25 | 55.6 | 4 | 8.9 | 7 | 15.6 | 1 | 2.2 | 2 | 4.4 | — | — | 6 | 13.5 |
| Lawrence Coll. (Inst. of Paper Chem.) | 1 | 45 | 45 | — | — | 45 | 100.0 | — | — | — | — | — | — | — | — | — | — |
| Louisiana State Univ. | 13 | 66 | 63 | 47 | 74.6 | 10 | 15.9 | 4 | 6.3 | — | — | — | — | — | — | 2 | 3.2 |
| Loyola Univ. (Chicago) | 4 | 12 | 12 | 8 | 66.7 | 1 | 8.3 | 2 | 16.7 | — | — | — | — | — | — | 1 | 8.3 |
| Marquette Univ. | 9 | 26 | 24 | 14 | 53.2 | — | — | 4 | 16.7 | 4 | 16.7 | 1 | 4.2 | — | — | 1 | 4.2 |
| Maryland, Univ. of | 14 | 147 | 146 | 17 | 11.6 | 91 | 62.4 | 4 | 2.7 | 20 | 13.8 | 4 | 2.7 | 6 | 4.1 | 4 | 2.7 |
| Massachusetts Inst. of Tech. | 9 | 246 | 236 | 53 | 22.5 | 102 | 68.7 | 1 | .4 | 13 | 5.5 | — | — | 6 | 2.5 | 1 | .4 |
| Massachusetts State Coll. | 9 | 40 | 37 | 11 | 29.7 | 22 | 59.5 | 1 | 2.7 | 1 | 2.7 | 1 | 2.7 | — | — | 1 | 2.7 |
| Michigan Coll. of Mining and Techn. | 1 | 2 | 2 | 2 | 100.0 | — | — | — | — | — | — | — | — | — | — | — | — |
| Michigan State Coll. | 9 | 84 | 79 | 9 | 10.4 | 37 | 46.9 | 5 | 6.3 | 18 | 22.8 | 2 | 2.5 | 6 | 7.6 | 2 | 2.5 |
| Michigan, Univ. of | 34 | 1,013 | 935 | 467 | 45.9 | 265 | 28.4 | 52 | 5.6 | 91 | 9.7 | 97 | 9.0 | 10 | 1.1 | 14 | 1.5 |
| Minnesota, Univ. of | 32 | 809 | 764 | 189 | 24.7 | 237 | 31.0 | 45 | 5.9 | 189 | 24.7 | 25 | 3.3 | 45 | 5.9 | 34 | 4.5 |
| Missouri, Univ. of | 22 | 187 | 181 | 64 | 35.4 | 35 | 19.3 | 12 | 6.6 | 49 | 27.1 | 12 | 6.6 | 7 | 3.9 | 2 | 1.1 |
| Nebraska, Univ. of | 24 | 194 | 186 | 107 | 57.6 | 49 | 26.3 | 19 | 10.2 | — | — | 4 | 2.2 | 1 | .5 | 6 | 3.2 |
| N. Y. State Coll. of Forestry (Syracuse Univ.) | 1 | 13 | 12 | 5 | 41.7 | 7 | 53.3 | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | |
|--------------------------------|----|-------|-------|------|-------|-----|------|-----|------|-----|------|----|------|----|-----|----|------|
| New York Univ. | 28 | 850 | 776 | 369 | 47.6 | 102 | 13.1 | 165 | 21.3 | 59 | 7.6 | 32 | 4.1 | 21 | 2.7 | 23 | 3.6 |
| Niagara Univ. | 7 | 25 | 24 | 16 | 66.7 | — | — | 5 | 20.8 | 1 | — | 8 | 1.3 | 3 | 1.3 | 3 | 12.5 |
| North Carolina, Univ. of | 17 | 240 | 224 | 162 | 72.4 | 41 | 18.3 | 10 | 4.5 | 1 | — | — | — | — | — | 4 | 1.8 |
| North Dakota, Univ. of | 8 | 16 | 15 | 10 | 66.7 | — | — | 8 | 20.0 | — | — | — | — | — | — | 2 | 13.8 |
| Northwestern Univ. | 27 | 409 | 343 | 99 | 28.9 | 69 | 20.1 | 20 | 5.8 | 76 | 22.2 | 39 | 11.4 | 21 | 6.1 | 19 | 5.5 |
| Notre Dame Univ. of | 7 | 60 | 58 | 21 | 36.2 | 23 | 48.3 | 7 | 12.1 | — | — | — | — | — | — | 2 | 8.4 |
| Ohio State Univ. | 29 | 937 | 876 | 516 | 58.3 | 302 | 34.5 | 41 | 4.7 | — | — | 6 | — | 5 | — | 6 | 7.7 |
| Oklahoma, Univ. of | 6 | 29 | 29 | 19 | 65.6 | 4 | 15.8 | 8 | 10.3 | 4 | — | 1 | 3.4 | — | — | 2 | 6.9 |
| Oregon State Coll. | 18 | 17 | 2 | 11.3 | — | 11 | 64.7 | — | — | 4 | 23.5 | — | — | — | — | — | — |
| Oregon, Univ. of | 10 | 20 | 13 | 65.0 | — | 1 | 5.0 | 1 | 5.0 | 4 | 20.0 | 1 | 5.0 | — | — | — | — |
| Pennsylvania State Coll. | 17 | 224 | 218 | 61 | 28.0 | 115 | 52.8 | 11 | 5.0 | 22 | 10.1 | 8 | 1.4 | 2 | — | 4 | 1.8 |
| Pennsylvania, Univ. of | 23 | 615 | 569 | 335 | 69.9 | 99 | 17.7 | 43 | 7.7 | 36 | 6.4 | 10 | 1.8 | 7 | 1.3 | 29 | 5.2 |
| Pittsburgh, Univ. of | 23 | 401 | 368 | 171 | 47.8 | 80 | 22.3 | 67 | 18.7 | 7 | 2.0 | 4 | 1.1 | — | — | 29 | 8.1 |
| Princeton Univ. | 13 | 477 | 463 | 237 | 56.4 | 123 | 27.0 | 13 | 2.8 | 42 | 9.1 | 11 | 2.4 | 5 | 1.1 | 10 | 2.2 |
| Purdue Univ. | 13 | 137 | 127 | 36 | 28.3 | 79 | 24.2 | 6 | 6.6 | 3 | 2.4 | 4 | 3.1 | 3 | 2.4 | 2 | 1.6 |
| Randolph Coll. | 20 | 123 | 91 | 63 | 69.2 | 22 | 24.2 | 6 | — | — | — | — | — | — | — | — | — |
| Rensselaer Polytechnic Inst. | 4 | 92 | 10 | 8 | 42.1 | 7 | 36.8 | — | — | — | — | — | — | — | — | 4 | 21.1 |
| Rice Inst. | 5 | 40 | 38 | 21 | 55.2 | 13 | 34.2 | 2 | 5.3 | — | — | — | — | — | — | 2 | 5.8 |
| Rochester, Univ. of | 12 | 116 | 110 | 26 | 23.6 | 54 | 49.2 | 4 | 3.6 | 19 | 17.3 | 1 | — | 2 | 1.8 | 4 | 3.6 |
| Rutgers Univ. | 12 | 93 | 89 | 15 | 16.9 | 57 | 64.0 | 8 | 9.0 | 7 | 7.9 | 1 | 1.1 | — | — | 1 | 1.1 |
| St. John's Univ. (Brooklyn) | 1 | 3 | 3 | 3 | 100.0 | — | — | — | — | — | — | — | — | — | — | — | — |
| St. Louis Univ. | 18 | 110 | 103 | 48 | 46.6 | 13 | 12.6 | 6 | 5.8 | 21 | 20.4 | 14 | 13.6 | — | — | 1 | 1.0 |
| Smith Coll. | 2 | 2 | 2 | 1 | 60.0 | 1 | 50.0 | — | — | — | — | — | — | — | — | — | — |
| South Carolina, Univ. of | 2 | 6 | 6 | 5 | 33.3 | — | — | 1 | 16.7 | — | — | — | — | — | — | — | — |
| South'n Baptist Theol. Sem. | 1 | 127 | 117 | 39 | 24.8 | — | — | 7 | 6.0 | — | — | — | — | — | — | 81 | 60.2 |
| South'n Calif., Univ. of | 25 | 192 | 166 | 120 | 72.4 | 14 | 8.4 | 17 | 10.2 | 2 | 1.2 | 4 | 2.4 | — | — | 9 | 5.4 |
| Stanford Univ. | 25 | 593 | 349 | 238 | 68.2 | 72 | 20.6 | 8 | 2.5 | 2 | 1.6 | 15 | 4.3 | 2 | — | 12 | 8.4 |
| Syracuse Univ. | 9 | 57 | 52 | 28 | 53.9 | 12 | 23.1 | 6 | 11.5 | 2 | 3.8 | — | — | 1 | 1.9 | 3 | 5.8 |
| Tennessee, Univ. of | 1 | 3 | 3 | 2 | 66.7 | — | — | — | — | — | — | — | — | — | — | 1 | 33.3 |
| Texas, Univ. of | 15 | 276 | 264 | 189 | 71.5 | 58 | 22.0 | 15 | 5.7 | — | — | — | — | — | — | 2 | 8.8 |
| Tulane Univ. | 8 | 15 | 14 | 6 | 42.9 | 3 | 21.4 | 2 | 14.3 | — | — | — | — | — | — | 3 | 21.4 |
| Union Theol. Sem. | 1 | 26 | 26 | 16 | 61.0 | — | — | 3 | 11.5 | — | — | — | — | — | — | 7 | 26.9 |
| Vanderbilt Univ. | 16 | 89 | 83 | 65 | 78.4 | 10 | 12.0 | 6 | 7.2 | — | — | — | — | — | — | 2 | 2.4 |
| Virginia, Univ. of | 15 | 196 | 192 | 76 | 39.5 | 65 | 33.9 | 6 | 3.1 | 37 | 19.3 | 4 | 2.1 | 1 | — | 3 | 1.6 |
| Washington, State Coll. of | 7 | 27 | 25 | 2 | 8.0 | 20 | 80.0 | 2 | 8.0 | — | — | — | — | — | — | 1 | 4.0 |
| Washington Univ. (St. Louis) | 20 | 109 | 100 | 38 | 38.0 | 32 | 32.0 | 4 | 4.0 | 14 | 14.0 | 3 | 3.0 | 2 | 2.0 | 7 | 7.0 |
| Washington, Univ. of (Seattle) | 22 | 244 | 225 | 82 | 36.5 | 53 | 23.6 | 18 | 8.0 | 49 | 21.8 | 12 | 5.3 | 10 | 4.4 | 1 | — |
| West Virginia Univ. | 10 | 39 | 35 | 13 | 37.1 | 15 | 42.8 | 1 | 2.9 | 5 | 14.3 | — | — | — | — | 1 | 2.9 |
| Western Reserve Univ. | 17 | 133 | 145 | 71 | 49.0 | 40 | 37.5 | 20 | 13.8 | 11 | 7.6 | — | — | 1 | — | 2 | 1.4 |
| Wisconsin, Univ. of | 34 | 1,928 | 1,235 | 445 | 36.1 | 419 | 33.9 | 35 | 2.8 | 246 | 16.0 | 38 | 3.1 | 28 | 2.3 | 24 | 1.9 |
| Yale Univ. | 41 | 1,187 | 1,095 | 696 | 63.6 | 243 | 22.6 | 31 | 7.4 | 4 | — | 31 | 2.8 | 2 | — | 33 | 3.0 |

table shows (to cite but a few examples) only 29 percent of the decade's Ph.D.'s in chemistry engaged primarily in teaching as compared with 89 percent for the department of English; 66 percent of the chemists were primarily research workers as compared with 5 percent of the group from English; a relatively small proportion of either department give up scholarly endeavor for administrative work—4 percent for chemistry and 5 percent for English. Most other departments were between the extremes shown for chemistry and English in the proportions placed in teaching and research.

There are obvious implications for the revision of graduate programs in education in the fact that this field alone placed nearly as many people in administration as the other 49 departments combined. Since most of these 848 administrators were in precollegiate agencies of education, the department of education was much less dominant in the administration of higher education than might be inferred from the data of Tables XI and XIII. About one-third of all administrators supplied by the decade's doctoral graduates were in the several types of institution of higher education and the rank order of departments supplying most of them were education, psychology, history, and philosophy. Most of the administrators for industrial and governmental research agencies came from chemistry, economics, and the several specializations of agriculture. Since these persons administer agencies directly related to their fields of specialization, they probably have relatively little need for broad administrative training as part of their work for the doctorate; however, this generalization would not hold for a department so dominant in administrative placement as is education.

Table XII shows how each graduate school distributed its product as among teaching, research, administration, their combinations, and miscellaneous other duties. In this table, before making institutional comparisons, it is particularly important for the combination categories to be divided equally and added to the appropriate main category, as is demonstrated by comparing the uncombined distribution made by the University of California at Berkeley with that of the University of Minnesota.

Except for a conviction that he must publish the data as received from the individual institutions, the compiler would have made these consolidations in Table XII himself. At any rate, the reader who observes this red flag of caution can interpret the table for himself and can make such comparisons as are pertinent to his purposes. A casual inspection will make evident to the general reader that some graduate schools need to be concerned much more than others with the problems of preparing teachers, that schools with large enrollments in the field of education have an identifiable responsibility for training administrators, and finally that institutions vary widely in the proportion of their Ph.D. graduates listed as primarily engaged in research. Most of the persons listed in column 17 as having duties which were primarily neither teaching, research, nor administration, earned the Ph.D. degree in schools of theology and work as clergymen and nonteaching missionaries.

Table XIII distributes the persons engaged in teaching, research, administration, and miscellaneous duties so as to show the proportion of each category employed in university graduate schools, undergraduate four-year colleges, junior colleges, other educational agencies, governmental nonacademic agencies, and private pursuits. In this table the compiler has cut the Gordian knots of combination categories. It gives an over-all picture for the 20,783 gainfully employed doctoral graduates; for 55 percent the main duty was teaching, for 31 percent the main duty was research, and for 10 percent the main duty was administration. The primary duty of 772 persons, 4 percent of the group, was not classifiable under any of the three main headings.

The analysis by types of institution and agency presented in Table XIII has obvious implications for graduate schools that want to prepare a candidate adequately for the major duty or duties likely to be required of him. It offers justification for training prospective and actual employees of graduate, professional, and arts and science institutions in both teaching and research, with the major emphasis going to teaching. At the graduate level, teaching is for the most part inseparable from helping others to develop research skills and scholarly under-

TABLE XIII

TYPES OF DUTY BEING PRIMARILY PERFORMED, AS OF SEPTEMBER 1940, BY EMPLOYED RECIPIENTS OF PH.D. DEGREE, 1930-31 TO 1939-40; BY TYPES OF EMPLOYMENT^a

| Types of Employment | Types of Duty | | | | | | | | | |
|---|---------------|-----------------------|------|-----------------------|------|-----------------------------|------|--------------------|------|--|
| | All | Teaching ^b | | Research ^c | | Administration ^d | | Other ^e | | |
| | | No. | % | No. | % | No. | % | No. | % | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| All Types | 20,783 | 11,493 | 55.3 | 6,413 | 30.9 | 2,105 | 10.1 | 772 | 3.7 | |
| University (Graduate School) ^f | 5,459 | 3,840 | 70.3 | 1,404 | 25.8 | 207 | 3.8 | 8 | .1 | |
| College ^g | 7,512 | 6,460 | 86.0 | 552 | 7.4 | 492 | 6.5 | 8 | .1 | |
| Junior College | 545 | 465 | 85.3 | 8 | 1.5 | 72 | 13.2 | — | — | |
| Other Educational Agencies ^h | 1,239 | 689 | 55.6 | 58 | 4.7 | 490 | 39.5 | 2 | .2 | |
| Public Nonacademic Agencies | 1,898 | 24 | 1.3 | 1,333 | 70.2 | 463 | 24.4 | 78 | 4.1 | |
| Private Nonacademic Agencies | 4,130 | 15 | .4 | 3,058 | 74.0 | 981 | 9.2 | 676 | 16.4 | |

^a Does not include holders of degree from Harvard University and the University of Illinois.

^b Including half of cases originally reported as "teaching and research" and "teaching and administration" respectively.

^c Including half of cases originally reported as "teaching and research" and "research and administration" respectively.

^d Including half of cases originally reported as "teaching and administration" and "research and administration" respectively.

^e See Note a, Table X, for explanation.

^f Including half of cases originally reported as "university and college."

^g Largely precollegiate, but including state departments of education.

standing. With research as the major duty of only 7 percent of the 7,512 persons employed in four-year undergraduate colleges and 2 percent of the 545 working in junior colleges, there is little reason for graduate schools to continue to prepare this two-fifths of their total output as if it were likely to do substantial research. Since teaching is the major duty of 86 percent of persons in this group there is every reason to help them prepare for the work they are most likely to do.

Table XIII indicates that schools and departments preparing doctoral candidates for work in the agencies of education other than universities, colleges, and junior colleges should take cognizance of preparation for both administration and teaching. However, it has already been shown that most of those going into such agencies take their Ph.D. degree in the field of education; this leaves subject-matter departments here with a responsibility not unlike that they have for undergraduate colleges. The fact that 24 percent of the 1,898 persons in public nonacademic agencies (that is, in government) have administration as their major duty points to the need for at least a few graduate schools to expand their facilities for training public administrators. But, as far as government work is concerned, major emphasis will still be required on developing competent research workers for no less than 70 percent of the group there employed have research as their major assignment. Public and likewise private nonacademic agencies (the latter having 74 percent engaged primarily in research) thus make as clear a demand on graduate schools for research specialists as do the undergraduate schools for specialists in teaching.

In the last analysis, Table XIII is a rough index of a decade of graduate placement. It offers the graduate school of the future justification for deliberately choosing the kinds and levels of teaching, administration, and research for which it will offer the Ph.D. degree. Most candidates for the degree are already in or have chosen the agency in which they will work by the time they reach graduate school; the nature of the primary functions the majority are likely to perform is clearly foreshadowed. And these tendencies are likely to increase rather than diminish.

A COMPARISON OF THE ED.D. AND THE PH.D. IN EDUCATION

Most of the perplexing problems in graduate work come into sharp focus when attention is centered on program requirements for the Ph.D. degree in professional and semiprofessional fields. To point up the discussion, numerically the most important of these fields—education—has been selected for further analysis. Holders of its Ph.D. degree will be compared, as to employment status, with those persons who earned the doctor of education (Ed.D.) degree during the 1930's. Complete data on recipients of these two degrees are fortunately available, reports having been provided by all graduate institutions granting them during the decade.²

By 1918 the issues were drawn between representatives of the graduate art and science areas and those of the semiprofessional fields. Representatives of the older disciplines doubted that the newer fields had a body of scholarly knowledge sufficient for offering the Ph.D. degree. They objected to what professional groups considered suitable research topics for dissertations. They disapproved the tendency to use unorthodox research tools and techniques, especially when at the expense of French and German or other foreign-language requirements. The field of education, particularly, felt it must have some qualitative modifications of these requirements or that it must begin to offer its own doctorate as a professional degree.

Through the processes of compromise common in a democracy, faculties of most institutions found ways to make a place in the usual graduate family for the field of education, although this was accomplished at the cost of continuous mutterings of dissatisfaction. Not all universities made these adjustments and some graduate schools of education preferred to give a professional doctorate, usually the Ed.D. degree. The Graduate School of Education at Harvard University awarded the first such degree in 1922 and by 1940 twenty-four institutions were con-

² Thus Tables XIV, XV, and XVI (to follow), in contrast to earlier tables, include information from Harvard University (Ed.D.) and the University of Illinois (Ph.D. in education). Readers should note that this inclusion of Illinois data yields figures that differ slightly from those previously presented for the Ph.D. in education.

ferring it intermittently. The awards usually were made independent of the graduate faculty or else through a franchise from it which provided essential autonomy. The intent was to design a distinct degree suited particularly to the needs of school administrators and supervisors, but in most institutions as it has gained in prestige it has taken on more and more of the characteristics of the Ph.D. in education. In some of the twenty-four institutions, California and Columbia being examples, the graduate student in education can choose whether he will work for the Ed.D. or the Ph.D. degree.

Lately there has arisen a further reaction against the award of graduate degrees in education as professional degrees. This movement looks upon the graduate education of teachers as an all-university function rather than primarily that of the school of education, but it is not particularly concerned with whether the Ed.D. or the Ph.D. is awarded for the work. For example, the graduate faculty at Northwestern University has authorized and fully administers the Ed.D. degree on an all-university basis; the department of economics sponsored the first student on whom this Ed.D. was conferred under a plan that awards it to any candidate who expects to follow teaching rather than research as a career. The University of Chicago is representative of the universities that plan programs for the Ph.D. in education on an all-university basis rather than exclusively through the school (in this instance, department) of education.

No one can safely predict the outcome of efforts to resolve these conflicting ideals concerning the nature and procedures of graduate work in education and the other professional fields. It is believed, however, that the comparison of a decade's history of production and employment for persons holding the Ed.D. and Ph.D. degrees will contribute information that may lead to the insights needed for a solution.

Table XIV presents a comparative overview of a decade of production and gross employment for the two types of doctorate in education. In making comparison it should be remembered that the Ph.D. in education is a mature and stable degree while the Ed.D. is a new and rapidly expanding degree. During the

TABLE XIV

ED.D AND PH.D. IN EDUCATION DEGREES CONFERRED, 1930-31 TO 1939-40, ON PERSONS STILL LIVING IN SEPTEMBER 1940, AND EMPLOYMENT STATUS OF RECIPIENTS AS OF THAT DATE; BY YEARS OF AWARD

| Year | Ed.D. | | | Ph.D. in Education ^a | | |
|------------------------------|---|---|--|---|---|--|
| | Number of Institutions Conferring Degree | Number of Persons Receiving Degree | Number of Degree Holders Employed | Number of Institutions Conferring Degree | Number of Persons Receiving Degree | Number of Degree Holders Employed |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Decade 1930-31 to 1939-40 | 24 | 804 | 758 | 56 | 2,731 | 2,598 |
| 1930-31 | 10 | 39 | 36 | 40 | 280 | 261 |
| 1931-32 | 10 | 25 | 24 | 37 | 310 | 287 |
| 1932-33 | 11 | 50 | 44 | 36 | 267 | 243 |
| 1933-34 | 14 | 41 | 34 | 39 | 278 | 249 |
| 1934-35 | 17 | 59 | 57 | 39 | 248 | 233 |
| 1935-36 | 18 | 69 | 66 | 37 | 272 | 253 |
| 1936-37 | 18 | 110 | 103 | 40 | 257 | 243 |
| 1937-38 | 18 | 105 | 102 | 36 | 251 | 236 |
| 1938-39 | 18 | 144 | 139 | 39 | 252 | 245 |
| 1939-40 | 20 | 162 | 153 | 37 | 316 | 298 |

^a Figures for Ph.D. in Education in Tables XIV, XV, and XVI include 18 persons from the University of Illinois who are not included in earlier tables.

period 1930-31 to 1939-40, twenty-four universities awarded 804 Ed.D. degrees as compared with 2,731 Ph.D.'s in education from fifty-six graduate schools. In the school year 1930-31 ten institutions awarded the Ed.D. degree to 39 persons as compared with forty universities that awarded the Ph.D. degree in education to 280 persons. By the end of the decade, 1939-40, the number of universities awarding the Ed.D. degree had risen to twenty and the number of persons receiving it to 162. In the same period the number of institutions awarding the Ph.D. in education dropped to thirty-seven, while the number of persons receiving awards during the last half of the decade was 1 percent of the total less than during the first five years of the period; this despite the fact that thirty-six more degrees were awarded in 1939-40 than in 1930-31.

The rate of acceleration in the above trends is more important for pointing up the increasingly favorable position of the Ed.D. degree than is the actual number of degrees awarded. The increasing momentum is further indicated by the fact that since 1940 Illinois, Michigan, Northwestern, and five other universities have authorized the award of the Ed.D. degree.

Table XV summarizes the decade's experience in production and employment for each of the twenty-four universities that awarded the Ed.D. degree. Paralleling the totals of the table is a listing of comparative data from the fifty-six graduate schools that awarded the Ph.D. in education. A comparison of the summary data points up interesting contrasts and similarities in the two degrees. From the totals in columns 2 and 3 it may be ascertained that approximately the same proportion of the two types of doctor were employed, namely 94 and 93 percent. In September 1940, 3 percent fewer recipients of the Ed.D. degree were employed primarily in graduate work, and 11 percent fewer were employed in four-year colleges. On the other hand, 1 percent more of the doctors of education were in junior colleges, and 18 percent more of them were in other educational agencies. Public and private nonacademic work attracted 5 percent fewer of the Ed.D. group. These figures support the generalization that the Ed.D. degree is largely awarded to precollegiate

TYPES OF EMPLOYMENT, AS OF SEPTEMBER 1940, OF EMPLOYED RECIPIENTS OF ED.D. DEGREE, 1930-31 TO 1939-40;
BY INSTITUTIONS CONFERRING DEGREE^a

^a Because of relatively small numbers in the cases of most institutions percentages have not been thought significant except for totals.

administrators and supervisors but the difference scarcely justifies awarding two degrees. An inspection of institutional distributions shows great individual variation in the proportion of degree holders employed in the various agencies. In other words some institutions do make the Ed.D. a distinctive degree.

The situation in individual institutions listed in Table XV can be noted by inspection and does not require interpretation. Graduate schools vary widely in the clientele served, as can be seen by comparing the distributions for Harvard University and the University of Pittsburgh. For example, Harvard placed 71 percent in the several types of institution of higher education, and Pittsburgh placed 75 percent in the other, chiefly precollegiate agencies of education. Despite these divergent emphases, catalog statements of requirements for the Ed.D. degree in the two institutions do not differ essentially.

The more detailed analyses in Table XVI compare the number and proportion of recipients of the Ed.D. and Ph.D. in education by the major duty performed in the several types of employing agency. In other words it breaks down the totals employed in university graduate and professional schools, four-year colleges, junior colleges, other educational agencies, and nonacademic agencies to show the number and proportion whose duties in September 1940 were primarily teaching, research, administration, or miscellaneous. Tables were prepared to show the differences in employment status of each graduating class of the decade but most of them were so insignificant that the tables are not reproduced. Instead, relevant items are introduced in the running comment of the succeeding paragraphs.

Table XVI presents a comparative picture of all employed holders of the Ed.D. and Ph.D. degrees in education. Half of the former group and 56 percent of the latter were engaged primarily in teaching. Administration was the primary but not exclusive duty of 44 percent of the Ed.D. recipients, and of 35 percent of the Ph.D. group. Research was the major concern of only 6 percent for either classification. No one of the differences is as great as might have been expected from two degrees having announced objectives that vary so widely.

TABLE XVI

TYPES OF DUTY BEING PRIMARILY PERFORMED, AS OF SEPTEMBER 1940, BY EMPLOYED RECIPIENTS OF ED.D.
AND PH.D. IN EDUCATION DEGREES, 1930-31 TO 1939-40; BY TYPES OF EMPLOYMENT

| Types of Employment | Types of Duty | | | | | | | | | | | | | | | | | |
|---|---------------|-----------------------|------|-----------------------|------|----------------------------------|------|--------------------|-----|-------|-----------------------|------|-----------------------|------|----------------------------------|------|--------------------|------|
| | Ed.D. | | | | | | | | | | Ph.D. in Education | | | | | | | |
| | All | Teaching ^a | | Research ^b | | Adminis- tration ^c | | Other ^d | | All | Teaching ^a | | Research ^b | | Adminis- tration ^c | | Other ^d | |
| | | No. | % | No. | % | No. | % | No. | % | | No. | % | No. | % | No. | % | No. | % |
| I | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| All types | 758 | 379 | 50.0 | 47 | 6.2 | 331 | 43.7 | 1 | 1.1 | 2,548 | 1,427 | 56.0 | 164 | 6.5 | 890 | 34.9 | 67 | 2.6 |
| University (Graduate School) ^e | 116 | 93 | 80.2 | 6 | 5.2 | 16 | 13.8 | 1 | .8 | 466 | 379 | 81.3 | 26 | 5.6 | 60 | 12.9 | 1 | .2 |
| College ^e | 220 | 170 | 77.3 | 3 | 1.4 | 47 | 21.3 | — | — | 1,022 | 761 | 74.4 | 15 | 1.5 | 245 | 24.0 | 1 | .1 |
| Junior College | 37 | 21 | 56.8 | 1 | 2.7 | 15 | 40.5 | — | — | 102 | 56 | 54.9 | 2 | 2.0 | 44 | 43.1 | — | — |
| Other Education- al Agencies ^f | 341 | 83 | 24.3 | 23 | 6.8 | 235 | 68.9 | — | — | 675 | 226 | 33.5 | 44 | 6.5 | 404 | 59.9 | 1 | .1 |
| Nonacademic Agencies | 44 | 12 | 27.3 | 14 | 31.8 | 18 | 40.9 | — | — | 283 | 5 | 1.8 | 77 | 27.2 | 137 | 48.4 | 64 | 22.6 |

^{a,b,c}, and ^e See Notes b, c, d, and f, Table XIII.

^d See Note a, Table X, for explanation.

^f Largely precollegiate, but including state departments of education.

The second horizontal row of Table XVI supplies documentation for the generalization that in university graduate and professional schools above 80 percent of these persons were engaged primarily in teaching, and that only minor variations existed in the proportion of Ed.D. and Ph.D. graduates employed in either of the three major categories of duties. However, there were significant differences in the proportion of each class of the period going to make up these totals. Graduate employment for the Ed.D. group would be described by a curve which rises evenly each year of the decade from 8 percent of the class of 1930-31 to 15 percent of the class of 1939-40. The comparable situation for Ph.D.'s in education would be described by an evenly descending curve that started with 20 percent of the class of 1930-31 and ended with 13 percent of the class of 1939-40. The unexpected trend for the Ed.D. degrees is, perhaps, accounted for by its increasing similarity to the Ph.D. degree and to the rapid rise of graduate work in teachers colleges.

A comparison of the two types of degree holder employed at the undergraduate level of college work shows approximately 75 percent of those in four-year colleges and roughly 55 percent of those in junior colleges engaged primarily in teaching, with no significant differences between the two groups. Only about 3 percent more of the Ph.D. recipients became college administrators. There were no important differences in the proportions of each group engaged in research when the four-year and two-year colleges are combined. The trend of proportions from each class of the decade going into college and junior college, however, is almost the reverse of that stated in the preceding paragraph for the graduate level of employment. Undergraduate Ed.D. placement shifts would be described by an evenly descending curve that began with 39 percent of the class of 1930-31 and ended with 29 percent of the class of 1939-40. The corresponding figures for Ph.D.'s in education would produce a curve rising gradually from 35 percent of the class of 1930-31 to 40 percent of the class of 1939-40.

Agencies of education other than universities and colleges employed (see summary data, column 11 of Table XV) 45 per-

cent of the decade's Ed.D. recipients as compared with 27 percent of the Ph.D. holders. Table XVI shows their distribution among the major categories of teaching, research, and administration. Teaching was the primary duty of 24 percent of the Ed.D. and 34 percent of the Ph.D. recipients, research claimed nearly the same proportion of each group (7 percent) and administration got the lion's share all round, namely 69 percent of the Ed.D. and 60 percent of the Ph.D. graduates.

Proportionally only about half as many Ed.D. as Ph.D. recipients entered nonacademic pursuits, 6 percent as compared with 11 percent. Table XVI shows 27 percent of the Ed.D. group engaged primarily in nonacademic teaching as compared with 2 percent of the Ph.D. recipients. For the most part, people in this category were not very satisfactorily employed. They were training life-insurance and other types of sales people, and teaching in the WPA, CCC, and similar programs. A table not reproduced in this report shows that the depression classes of 1932-33 and 1933-34 contributed double their normal proportions to this category of nonacademic teaching.

IN CONCLUSION

What are the implications of the data for graduate school officials and students? Since our society, in its period of greatest unemployment, absorbed practically all of the employable doctors, the unwary may infer that the supply of Ph.D. graduates does not exceed the demand. Such students may feel encouraged to matriculate for a degree, believing that they will be readily and profitably employed in the field of their choice. Graduate school officials may be tempted to expand master's degree programs to the doctoral level. Some schools already offering the doctorate as a side line may feel justified in expanding offerings or at least going ahead with business as usual.

More cautious and discerning interpreters of the data are likely to make less optimistic inferences. They will suspect that the actual dislocations are greater in nature and number than the warning data of this study indicate. They will know that many of the satisfactory initial appointments will prove to be

temporary and will later frustrate the process leading to desirable permanent occupational status in institutions of higher education. They probably know that a large portion of the post-doctoral students in our universities are victims of this type of employment dislocation. They cannot forget that permanent appointments in most universities and colleges are more and more going to be limited to replacing those who die or retire and that frequently even these vacancies are not filled promptly.

The analytical interpreter will notice that the increases in employment were largely in nonacademic public and private positions, in teachers colleges, and in junior colleges. Apparently there are enough job satisfactions in these fields to assure a reasonable flow of doctorates to them in normal times. During and following the present war there is likely to be a rapidly increasing demand for Ph.D. graduates in the agencies of government, industry, and commerce. But satisfactory placement in these fields is likely to depend on a willingness of graduate schools to initiate or modify doctoral programs to suit the functional needs of the fields mentioned in this paragraph.

The astutely directed graduate school, most likely to keep abreast of the changing times, will make realistic differentiations in its doctoral programs based on ascertained differences in job demands. This is not to imply that there is no common core of fundamental study and training in research which all candidates for the Ph.D. degree in a given field will pursue. Rather it is to emphasize differences in the work (and hence in the preparation needed) of Ph.D. recipients in chemistry, for example, who teach in high school, do research for duPont or the federal government, engage in college or university teaching, or undertake production as chemical engineers for General Foods Corporation.

The data suggest that a graduate school can no longer expect to offer advanced work opportunistically as an incidental side line. Neither can the more enterprising school offer doctoral work in most of its undergraduate departments. The graduate school of the future seems destined to have to choose deliberately the kinds and levels of teaching, research, and administration

for which it will offer the Ph.D. degree. Almost no graduate department can hope to secure the physical facilities, the staff, and the operating budget necessary to prepare teachers, administrators, and research workers for the numerous levels of higher education, for the several levels of precollegiate education, and for the varied specializations in government, industry, and commerce. To be of maximum benefit to their advanced students and to the society which they serve, graduate schools must face realistically all of the issues inherent in restricted offerings, selective admissions, and effective placement. The next decade probably will demand a smaller number of more soundly educated and functionally prepared doctors of philosophy.

IV

Suggestions from Lay Employers of Ph.D. Graduates

THE GRADUATE SCHOOL officials who cooperated with the Commission on Teacher Education in analyzing the employment status of the decade's Ph.D. recipients, thought that further leads for strengthening their programs might be obtained from the judgments of those most concerned with the professional value of the degree. They accordingly asked for a study of the opinion of employers of their product and likewise of the degree holders themselves. They were eager to know how effective doctoral training was considered in preparing for scholarly careers in socially significant work.

In this chapter and the two that follow it the results are presented of an attempt to comply with this request. After a brief overview of the steps taken to secure a representative sampling of relevant judgment, the current chapter is devoted to statements secured from employers in nonacademic fields. These have to do with the training held to be most needed at the doctoral level for increasing the chances of success in research and related positions open in government and private industry. Chapter V presents the opinion of selected appointing officers in collegiate and precollegiate educational institutions of many kinds with regard to the preparation required for discharging the major duties commonly assigned to staff members. Chapter VI provides a glimpse of graduate study through the eyes of recent recipients of the Ph.D. degree. The material for the three chapters was secured through a series of conferences, questionnaires, and visits to individual graduate schools. These will be described briefly at this point and elaborated as necessary in the appropriate sections of the discussion.

The first step taken by the Commission toward securing the opinion of employing groups on graduate practice was a national conference, undertaken at the suggestion and with the cooperation of a group of graduate school officials. On this occasion an attempt was made by the individuals invited to attend to develop a bill of particulars that would draw attention to all major aspects of the preparation necessary for specified types of position. This proved to be too comprehensive an assignment for a single conference. Accordingly, a series of regional conferences was organized to extend and sharpen the situational thinking stimulated by the initial meeting.

Deliberation in these conferences centered on the similarities and differences in the preparation required for scholarly occupations as diverse as those in industrial and commercial research, in federal and state government, and those in college and university teaching. More often than not the spotlight was on ways and means of improving programs and procedures for the education of doctoral candidates who are or expect to become teachers of college undergraduates. The discussions attempted to promote a meeting of minds on the curricular fundamentals that should constitute a common core of experience for all candidates, on those that should be differentiated in terms of occupations or potential occupations of the candidates, and on the procedures for achieving these ends. Among the focal emphases were the nature of the research project; the importance of rounding out general education and personality development through counseling, clinics, and course work; and how to orient graduate students and faculty to the occupational realities of the *whole* job.

The issues developed in the conferences were formulated into a schedule of questions and submitted to a carefully selected group of 204 influential American educators for brief written statements of viewpoint, judgment, or specific opinion. The composition of this group, most of whose members had participated in the conferences, and representative excerpts from their testimony are recorded in Chapter V. With appropriate modifications in form of statement these issues along with other ques-

tions were submitted, in the manner to be described in Chapter VI, to a scattered sampling of recent recipients of the Ph.D. degree. Appointing officers in industrial and governmental agencies were not asked to respond to a special form of this questionnaire because there was already available an expression of their opinion in a three-volume report of the National Resources Planning Board.¹ The findings and discussion are sufficiently germane to the present analysis to warrant consideration in some detail. It will be of interest to examine the situation disclosed and the opinions offered—particularly those of an educational nature—before proceeding to the results of the opinionnaire just mentioned.

NATURE AND EXTENT OF PROFESSIONAL RESEARCH

A word is in order at the outset with respect to “research” as here conceived. While the term is used very loosely in industrial departments of research and has been found to cover routine checking and testing—for that matter, simply keeping up with the literature—as well as highly technical experimentation, it nevertheless may be said to connote for most people some aspect of strictly defined scientific procedure.

This concept of research as objective measurement, observation, and controlled experiment, with its consequent highlighting of the exact sciences, appears to predominate throughout American culture including academic circles.² Budgetary allowances specifically for research on or off the campus are usually made more largely for the physical and biological sciences than for the social sciences and humanities—despite a few such notable exceptions as the Institute of Human Relations at Yale University, the Institute for Research in Social Science at the University of North Carolina, or the Foundation for the Advancement of the Social Sciences at the University of Denver. Furthermore, when research is conducted in these fields, the standard of the exact sciences tends to exercise a powerful—pos-

¹ *Research—A National Resource* (Washington: National Resources Planning Board, 1938-1941).

² For substantiating data see, Ernest V. Hollis, *Philanthropic Foundations and Higher Education* (New York: Columbia University Press, 1938), Chapter XII.

sibly an undue—influence. Educational research, for instance, devotes itself far more to psychological testing, statistics, and control groups than to the exercise of critical insight, imaginative synthesis, or comparative analysis.

Accordingly, when the university administrators listed some of their graduates for the present study as occupied primarily in research, they were obviously using the term in this limited, scientific connotation. For it should hardly need emphasizing that the 10,839 individuals recorded as engaged in teaching (for the most part at the collegiate level) without primary responsibility for either research or administration were certainly expected to continue their individual studies in their several fields. Productive scholarship is still a major consideration almost everywhere in matters of advancement and professional reputation. But for purposes of clarity and simplification, research will be used throughout the following discussion in this somewhat restricted sense of the exact sciences.

No precise figures are available on the numbers engaged in the United States in research as a full-time vocation. Restricting their calculations to professionally trained men and women and thus disregarding the technicians, administrators, and clerical workers in research organizations, the National Resources Planning Board estimated their number to be around 50,000 in 1938.³ Of this total some 40 percent were thought to be in industry, 10 percent in business and commerce, 20 percent with the federal government, and 30 percent in colleges and universities. Two years later the National Research Council surveyed the situation in industry for the National Resources Planning Board and noted an increase of 41 percent over 1938.⁴ Roughly half of this increase represented real growth while the other half was due to improved coverage in the questionnaire returns. Since there is no reason to suppose similar increases occurred in the other categories, with the possible exception of the federal

³ For the argument see *op. cit.*, I, "Relation of the Federal Government to Research," pp. 171-75.

⁴ *Ibid.*, II, "Industrial Research," pp. 173-87.

government, the proportion of the total number in industry must accordingly be revised upward. The most important consuming market is thus revealed.

Among the 36,553 professionally trained men and women in industrial research located in 1940, as many as 43 percent were chemists and 41 percent engineers. The physicists accounted for nearly 6 percent, the metallurgists for over 5 percent, biologists 3 percent, and the remaining 2 percent covered scientists of miscellaneous specialties. American chemical industries were the first to recognize the commercial value of pertinent research and chemists still preponderate today in industrial laboratories. The several engineering specialists—notably chemical, electrical, and mechanical engineers—are a close second to the chemists and these two groups together actually set the tone. The physicists had to take the initiative about securing a hearing for themselves from industrial employers but are now steadily gaining in importance—as are also the biologists and mathematicians. At the same time, the report considers the biologists badly neglected—more especially by the food industries; actually the federal government is more hospitable to them through its Department of Agriculture. Mathematicians (along with economists, psychologists, and statisticians) find most of their best outlets in commerce and business.

PREPARATION FOR INDUSTRIAL RESEARCH

The volume on industrial research in the report of the National Resources Planning Board was prepared by a committee of the National Research Council and, for the most part, specifically by directors of industrial laboratories. It sets forth the status and scope of research in modern industry and the role it has played in developing the American standard of living. Great care was taken to be as representative as possible and to give due consideration to conflicting theories and viewpoints. While the whole volume—for that matter all three volumes of the report—is thus clearly of major interest to educators who train students for research positions, the particular concern here

is with the ideas and opinions offered on the qualities held to be necessary to success in industrial research and on the training called for to develop those qualities.

The section on "careers in research" was prepared by W. A. Gibbons of the United States Rubber Company.⁵ It was "reviewed by a large number of research directors, whose suggestions have, as far as possible, been included." Considerable diversity of opinion was discovered as to the relative importance of certain qualities or types of training desired in candidates for research positions, reflecting in large measure the great variety of available jobs to be done and the varying demands of different industries. Substantial agreement was, however, expressed with regard to the points to be given herewith; differences had to do with relative emphasis more than anything else.

Among the traits called for were many that even the layman would have thought essential to scientific research, such as intellectual integrity, scientific curiosity, and the creative urge. It is significant that these directors of research recognized the full relevance of such additional qualities as enthusiasm and receptiveness to new ideas, ambition and diligence, perseverance, courage and self-confidence, judgment, imagination, and ingenuity. They wanted graduate schools to give attention to developing these qualities, a responsibility not commonly accepted by university professors. The comment of one research director who read this section is worth quoting, in part, in this connection:

In larger organizations . . . there is opportunity to carry the results of fundamental research through rather large-scale operations in a developmental laboratory, but with smaller organizations it is necessary to make the jump sometimes rather drastically from small-scale "test-tube" experiments to mill operation, and this jump takes a lot of courage and careful application of fundamental knowledge combined with knowledge gained from practical experience together with a good measure of common sense and intuition.⁶

The section goes on to ask for the development of certain other traits found necessary to a successful career in industrial

⁵ *Ibid.*, pp. 108-19.

⁶ *Ibid.*, p. 109.

research. For instance, ability to cooperate is considered fundamental because "the research worker frequently has to seek the advice and assistance of his fellows" and "he must be prepared to reciprocate in turn." Furthermore, he often has to go for help to "persons and facilities in other parts of the company." Then, a worker in industrial research must be practical "in the sense of recognizing as important not only the purely scientific aspects of his work but also its practical consequences." The pertinence and applicability of his findings are a measure of this trait. Common sense is considered as important to a research worker as to anybody else. By the exercise of this quality he "will give proper weight to the opinions of others even though these are not expressed in technical terms," he will be tolerant, and "more interested in the spirit of things than in the letter."

On the side of essential training, primary emphasis is placed on a "thorough grasp of the fundamentals of the chosen science." In view of the comment frequently heard in academic circles to the effect that "narrow specialization is all very well for the research worker," the following statement is worth pondering:

One of the commonest criticisms of graduate students who apply for positions in industrial research is that they are weak in their grasp of these fundamentals and lack a working knowledge of them. A broad training with particular emphasis on these classical fundamentals is more desirable than a highly specialized training in some one technique, the utility of which may be limited. It is also of far more value for research work than a training in the specific industrial applications of science.⁷

The basic training should also include "sciences closely related to the specialty chosen." This is particularly valuable for work in small organizations with "a wide field of problems." Mathematics is "not only necessary for an understanding of physical science," but in recent years "in the form of statistical analysis has been applied to a considerable extent in the planning of experiments, in the analysis of experimental data, and in the control of production." Certain nonscientific subjects were likewise generally agreed upon as essential. For instance,

⁷ *Ibid.*, p. 112.

"it is particularly important for the scientific man to be able to write and speak clearly and effectively," since "before the results of research work can be used, they must be understood and appreciated by others." Finally, "the prospective worker in industrial research may properly regard social contacts as part of his training." Extracurricular activities "can do much to develop a satisfactory personality and an understanding of human nature, which are so important in cooperative work." Few graduate schools have fully accepted the responsibility for cultural education and personality development here emphasized by the directors of industrial research laboratories. It is evident that they want the graduate school to develop the "whole man."

There was some disagreement over the amount of preliminary training to be demanded of candidates for positions in industrial research. However, "for a lifetime career in research, and particularly for work in fundamental research, the training required for a doctor's degree is believed desirable by most of the research directors who discussed this section of the report." The comment of one of these individuals on the values to be expected of advanced graduate work is particularly interesting: "It is not so much an opportunity to specialize in a chosen subject as a chance to develop the technique and capacity for specializing in any research problem which may later be encountered."⁸

Others stressed the great educational value of "informal association . . . with the research professor who has demonstrated his research ability." One person added the corollary that "post-graduate work in a school . . . where no new conceptions or creative thought are evident, is not of great value."

SOME SPECIFIC APPLICATIONS

From the foregoing it will be clear that there is no warrant for the conception of an industrial research expert as an isolated individual working exclusively with exact media and highly specialized problems. He must qualify as a human being and be alert to everyday social existence, if he is to succeed,

⁸ *Ibid.*, p. 112.

quite as much apparently as must the college teacher and educational administrator. The point will become even clearer when the situation is examined for certain groups of scientists in detail. Naturally enough, since they have to adjust to existing circumstances rather than themselves control conditions, the most thoughtful comments on educational matters were contributed by representatives of the less dominant sciences. Opinions will accordingly be presented on the desired training of biologists, metallurgists, and mathematicians.

The section on "the role of the biologist in industry" is the work of E. B. Fred (formerly dean of the College of Agriculture and of the Graduate School and now president of the University of Wisconsin) and C. N. Frey (director of the Fleischmann laboratories in New York City).⁹ In their discussion of the necessary training for an industrial biologist, the authors claim that such a person must have "a solid foundation of chemistry and physics to supplement biology so that he may think correctly regarding living things . . . in terms of their fundamental life processes and reactions." It is pointed out that too often course work in these supporting fields has been organized for the benefit of majors in chemistry and physics and not to serve the needs of other scholars who use them to buttress and enrich a different specialization. The same may be said of mathematics. A "more modest offering" is called for, "with emphasis on the fundamental science" (in this case, biology) and geared to its particular requirements. Furthermore, "the social implications of biological research have not received general recognition"; a trend is, however, developing to correct this omission and "there is reason to believe the biologist of the future will consider carefully the social and economic influences that may result from his researches." In other words, the industrial biologist should never forget that he is working with life in its multiple interactions.

For this reason he should also have a broad and integrated education in the biological sciences themselves. On the basis primarily of botany and zoology he will build his own specialized superstructure which will necessarily vary from individual

⁹ *Ibid.*, pp. 253-67.

to individual. In this connection, "the most important thing is the scientific and philosophical foundation on which any desired kind of structure can be built, and onto which another can be moved to replace the first." For while the initial superstructure may be developed in the graduate school, it will have to be continuously reconstructed "to meet changing needs and new developments." The industrial biologist cannot afford the narrow specialization reflected in the more than thirty recognized main subdivisions of the field. Frequently such subjects as (to mention a few) anatomy, bacteriology, cytology, dendrology, ecology, endocrinology, epidemiology, histology, mycology, parasitology, and toxicology are presented disconnectedly and "fail to give the student a well coordinated outline of the subject [biology] as a whole." Emphasis needs to be placed throughout on "the general pattern of life" and "the supposedly fixed parts of the endeavor rather than on details and decoration."

By way of illustration the expert in food research is cited, who needs to be well grounded in the basic sciences of his field but also must keep abreast of what is going on in genetics, histology, and plant pathology, if he is to be effective. This sort of continuous check and reorganization of one's knowledge is possible only to a person who is quite sure of the more stable basic principles. Without such "fundamental and comprehensive biological training" the application of research is too often "unduly delayed or frustrated." This set of standards for the preparation of an industrial biologist would be much more acceptable to the president of an undergraduate college seeking a professor of biology than would the older pattern of specialization by which, for instance, plant pathologists are trained.

The section on metallurgy, "research in the iron and steel industry,"¹⁰ proceeds in similar vein. It was written by Frank T. Sisco, the editor of *Alloys of Iron Research* (New York City). He quotes an earlier study to the effect that "the characteristics most conducive to success . . . are judgment and self-confidence based on a knowledge of fundamentals." Sisco does not think American metallurgical education has been wholly successful in this respect, largely because "the world has changed so fast

¹⁰ *Ibid.*, pp. 157-69.

that metallurgical curricula have not kept pace." He goes on to say that "it is generally recognized now that, in addition to the fundamentals of metallurgy . . . the graduate metallurgist needs a basic training in social and economic science if he is to cope adequately with any problems in the steel industry except fundamental research." He likewise deplores the fact that relatively few college curricula in this field include a foreign language; this is "a serious handicap, as at least one-third of the reports of metallurgical research published in recent years have appeared in German periodicals." On the other hand, a commendable feature of most such curricula is the requirement of 75 to 100 hours in a steel plant; frequently students "have a good idea of a blast furnace before they even calculate a heat balance." Mathematics, chemistry, physics, and usually mechanical drawing are standard elements in the total training.

The section on "industrial mathematics" is exceptionally interesting.¹¹ It is the work of Thornton C. Fry, director of mathematical research at the Bell Telephone Laboratories in New York City. The industrial mathematician is primarily a consultant to other research specialists. It is his function to "draw deductions" from the data "regarding things which could not be observed conveniently, if at all"; to make applications from one set of data to another; to reduce the amount of necessary experimentation or "fill the breach" when the needed experiment "is virtually impossible"; to reduce "complicated theoretical results and complicated methods of calculation to readily available working form"; and the like. Because of this essentially facilitating function he performs, the industrial mathematician must "have sufficient interest in practical affairs" to be reconciled to "the compromise and approximations which are necessary"; he must be "gregarious and sympathetic," "cooperative and unselfish," since he cannot be "at once consultant and competitor to his associates"; he must be versatile since "jobs change, and even the same job may . . . require very different mathematical techniques," and he of course must "be a man of outstanding ability."

Fry claims that there is "nowhere in America a school where"

¹¹ *Ibid.*, pp. 268-88.

the desired "training can be acquired." While "today we lead the world in pure mathematics . . . in the field of applied mathematics . . . we stand no further forward than at the turn of the century, and far behind most European countries." Most mathematicians active nowadays in industry "were trained as physicists or as electrical or mechanical engineers. . . . As scientists they are university trained, but as mathematicians they are self-educated." In addition to the usual college courses in algebra and "some geometry, particularly the analytic sort," the industrial mathematician should have had "as much analysis as he can absorb," and all of these subjects should be "taught with an attitude sympathetic to their applications and reinforced by theoretical courses in sound, heat, light, and electricity." He should put "heavy emphasis upon mechanics, elasticity, hydrodynamics, thermodynamics, and electromagnetic-field theory." He should "understand what rigor is," have some experience in "the use of divergent series or the modification of terms in differential equations," and enough experimental physics and chemistry to "give him a realistic outlook on the power as well as the perils of experimental technique."

It will be noted that all of the research directors quoted above emphasize essentially the same educational formula: training in the relatively unchanging fundamentals of a field combined with great flexibility such as implies wide knowledge, self-confidence, and an eye to practical relevance. A number of related sciences must be intimately known, in each case, and the social qualities of cooperativeness and sympathetic insight are stressed as much as intellectual integrity and skill in scientific techniques. Understanding of social, including economic, realities is considered indispensable. It is an understatement to suggest that graduate faculties could obviously profit from more contacts and the exchange of views with the leaders of industrial research.

V

Suggestions from Academic Employers of Ph.D. Graduates

AS ALREADY NOTED, the statistical information presented in Chapters II and III was supplemented by an analysis of the ideas on graduate study held by certain administrators of university schools. Usable answers from the questionnaire mentioned in the preceding chapter were received from 85 graduate deans; from 66 presidents of colleges of liberal arts, teachers colleges, and junior colleges; from 34 staff members of collegiate faculties; and from 19 representatives of the public schools. These 204 individuals were from forty-three states, the Canal Zone, and the District of Columbia. They represented some of the largest and most influential institutions of higher learning in the country and also some of the smaller and experimental types.

While the sample cannot be regarded as quantitatively representative of American educators, it does constitute a selection of considerable qualitative significance. The intention at the time the questionnaires were distributed was to analyze the returns so as to show the expected differences in opinion on adequate doctoral training held by individuals in the several types of position and institution. The idea was abandoned when the data showed that the range of judgment within any one classification was as great as that between categories or for the group of educators as a whole.

The statements furnished for this study by 204 of the country's outstanding educators make extremely interesting reading.

A great variety of opinion—and temperament—is apparent along with widely differing conceptions of the proper role in modern American life of higher education and the intellectual professions. While many individuals expressed considerable conviction and clarity of outlook, there is obviously no generally recognized or definitive viewpoint among them. Nobody gave the impression of feeling anything like solid popular support for his statements, though each appears to have a constituency. What this situation reflects, of course, is the unsteadiness if not confusion on the subject of higher education in the culture itself.

The opinions to be presented may be loosely classified and profitably discussed under the main headings of objectives and general procedure in the graduate school, personnel arrangements, and the doctorate as preparation for teaching.

OBJECTIVES AND GENERAL PROCEDURE

As already noted, the focus of most of the educational opinion offered was on the doctoral graduate as an educator, more specifically as a college teacher. Several items on the questionnaire—including those that elicited some of the best response—had to do with general or specific procedure connected with the process of securing a doctor's degree in preparation for such a career. The resulting opinions will be worth examining in detail.

The proper scope of graduate education

Perhaps no issue was of greater interest to the educators consulted than that of broadening the doctoral candidate's training to include more than purely intellectual discipline. There was substantial agreement to the effect that the prospective college teacher ought to be able to work and live cooperatively, should be willing to assume social responsibility, and should live as active and rich a life as possible. There was likewise, explicit as well as implicit in the statements made, rather widespread recognition of the fact that the average graduate student leaves much to be desired in such respects. The suggested remedies

offered showed however considerable variety, and there was rather marked difference of opinion over whether or not any remedy fell within the proper scope of graduate education.

Despite the fact that they were asked to suggest steps "aside from selective admission" for securing candidates with superior personal qualities, several educators claimed there really was no other way. The president of one college of liberal arts, for instance, thought it "well worth the investment of \$20.00 to have a Rorschach personality test made of every candidate seriously considered by a graduate school who wishes to enter the teaching profession." Three superintendents of schools were particularly emphatic about preliminary examinations "on the individual's total experience" or for the "selection of candidates as *persons*." Often educators, who recognized some responsibility beyond admission policies, put their main reliance for the subtler aspects of education on guidance and similar personnel procedures which are best discussed in the next main section of this chapter. The statement of a university dean of liberal arts is, however, worth quoting in detail, at this point, for its graphic posing of the problem:

I have just gone through a siege of selecting new faculty members. We had a vacancy in modern languages. Out of five candidates considered very seriously, one had the personal qualities which would make a good faculty person. He had only the master's degree. All the Ph.D.'s had some objectionable personality quirks. From the standpoint of training all were excellent. It seems too bad that graduate schools don't work on this problem. If a graduate school takes its work seriously, I think it would always have to have an assistant dean or personnel officer who would make it his job to help students, or to train faculty people who have graduate students under their supervision to do so.

A negative view on the key importance of developing the candidate's personal qualities is reflected in the statement of a graduate dean who thought it "too late to develop such traits" as cooperativeness and social competence after the candidate enters graduate school. There were many educators to agree with him:

By the time a person has reached the point of being a candidate

for a doctor's degree, his personality habits are so fixed that there is some doubt whether there is much opportunity to improve him. [*A university dean of liberal arts*]

If a person has not developed sufficient maturity to rate acceptably on these items by the time he enters on graduate work, little if anything can be done to improve him. [*The dean of instruction in a junior college*]

Some people, especially graduate deans, were quite explicit and emphatic about saying that educational development along the line of social adjustment was not a rightful charge upon the university:

The graduate school has little opportunity to make much contribution to the social adjustment of a graduate student. Perhaps we shall have to accept the fact that the period of graduate study, because of its concentration, represents a partial social hiatus between his undergraduate experience and his adult professional life. [*A graduate dean*]

These are all points on which I am convinced that institutionalized effort is misplaced. [*A university dean in the humanities*]

A student who needs such care is not a student, certainly not a graduate student, and most certainly not a college teacher who will get and hold a job these days. The period of rapid expansion [in higher education] seems to be over, and colleges looking for teachers don't have to ask the graduate school to play kindergarten. [*A graduate dean*]

The graduate school, in my opinion, should attend primarily to the curricular preparation of the graduate student and social, emotional, and what-have-you other elements should slip in unobtrusively wherever a good man and professor has a chance to help out a fellow human being. [*A college president*]

Few persons went as far in this direction, however, as a certain zoologist who claimed that "the fundamental criterion should be intellectual competence," while "regard for personal qualifications" becomes necessary only "if the individual seems unlikely to reach the highest levels of intellectual attainment. If he is really good enough intellectually he is likely to come through no matter how many personal peculiarities he may have." Another person placed the emphasis rather differently:

The first, but not the only qualification of a good teacher is knowledge of the field. It is true that this . . . by itself may not be enough, but on the other hand it is certainly not replaced by emotional attitudes, familiarity with extramural cultural life, or even techniques and methods of presenting subjects to students. The successful college or university teacher is born not made.

Despite this rather substantial and vocal minority, most of the individuals who responded to the questionnaire agreed with the liberal arts dean quoted earlier who wished the graduate school would "take its work seriously" and consciously make provision for the fullest possible development of its doctoral students. For instance, the president of a teachers college regretted the prevailing emphasis on "the minutiae of scholarship which have a tendency to dwarf imagination, initiative, and human qualities which make for individual effectiveness," especially since "most Ph.D.'s are placed where human relationships count." The president of a college of liberal arts similarly argued that "a broad view toward, and competence in relating, specialized fields to the larger objectives of organized society," ability to work "with students as well as subject matter," and the "habit of working in larger areas of community life" were just as important as intensive preparation in a special field. The nature of the issues involved is cogently analyzed in the following remarks of a particularly distinguished educator, the dean of a university college of liberal arts:

These questions reflect the attitude that has transformed the problem of teacher education during recent years, on account of the apparent necessity for the school to assume responsibilities that we thought were taken care of in earlier times by the family, the church, and the community. In some institutions this point of view seems to obscure almost entirely the necessity for attention to the subject that the prospective teacher is supposed to teach. I personally feel that much of this attention to extracurricular matters is necessary if the ordinary garden variety of Ph.D. is to be fitted out for the life that he will be called upon to live. . . . The two dangers of overspecialization in subject matter and neglect of subject material ought to be guarded against. The extreme of specialization on trivial and unimportant topics for long researches does not afford a person any point of view or background which results in vital instruction.

The many suggestions made for improving graduate practice, once the point is conceded that its scope should include the fullest possible education, usually followed one of two main lines of thought: emphasis on cultural courses with or without accompanying firsthand experiences, or emphasis specifically on human relationships. The former is illustrated first:

Make room on the graduate program of study for some cultural courses outside the major field—especially needed in the field of science where rapidly developing research and vast content plus vested departmental interest give us research snobs: highly competent but contemptuous and unable to teach. Often we find the reverse in the schools of education: all method and pedagogy and little content. [*A graduate dean*]

Considerable time should be devoted to field work in which theoretical abstractions are tested. [*A college president*]

The graduate school might improve the prospective teacher by setting an excellent example, showing a broad point of view toward college courses of a semiprofessional nature. [*A junior college president*]

Much good would come from giving a composite course of about six semester hours' value by the same group that conducts the "finals"—i.e., by expanding that ordeal to [cover] six to twelve weeks. [*The president of a state teachers college*]

The workshop organization for graduate work seems to me to promise most with respect to all-around development of doctoral candidates. [*A university director of laboratory schools*]

Improvement could be aided by bringing into his educational experiences broad contacts with contemporary culture and basic social, economic, and aesthetic understanding. [*The president of a state teachers college*]

The alternate viewpoint on this head, emphasizing the educational value of human relations as such, may be summarized in the words of a college president who said: "It should be done *personally* and not by courses." Along these lines, a chemistry professor thought that "graduate students usually associate only with those who are working in their field," and that "it would be very beneficial if they could be brought into contact with graduate students who are working in totally different subjects." Others called for "participation in community living while the

candidate is studying for his degree" [*a college president*], or "significant contacts with important [in this case] government officials, particularly those carrying large administrative responsibilities" [*a graduate dean in the District of Columbia*]. Still others, as already noted, put their main reliance for broadening students on personnel services and especially on individual guidance.

Several educators mentioned extracurricular activities as the best means of social and personal development. A college of liberal arts was reported as providing "suitable living arrangements" to this end for its graduate students, and "encouraging discussion, requiring training in public speaking, and organizing departmental groups or clubs." A professor of psychology reported beginnings in the same direction at his institution. One university dean thought that "to get the best results, the graduate school should be made into a kind of residential college," while another suggested "social groups built around the departments in which they work." The dean of a summer session thought that, once a candidate was admitted, improvement can be effected only through utilizing the university as a social laboratory "in which he can practice being the type of person we would like to see him become." The president of a state normal college added this consideration to the discussion:

A fairly large percentage of graduate students in education now are those who cannot get or cannot hold good positions. Sometimes the economy practiced in order to attend a graduate school keeps such students from taking part in the rich cultural possibilities of the graduate school and its community.

Closely related to this line of thought, indeed shading into it, is the matter of induction into the profession and contacts between students and their professors. Some of the most thoughtful and serious comments secured were made in this regard:

Give the graduate student responsibilities for discipline or instruction of undergraduates with compensation therefor; encourage his participation in community affairs through permitting him to substitute for staff members . . . exploit him if you will through writing for trade journals, religious periodicals, and the like. [*A graduate dean*]

Graduate schools might stimulate intellectual curiosity through permitting more initiative on the part of individual students. We can best teach people how to cooperate by cooperating with them. Relationships between staff members and students are very cold and indifferent because a large proportion of our graduate school staff members have practically no interest in students. [*The president of a state university*]

A graduate staff with good morale tends to impart this morale to the students. A constant emphasis on the importance of integrity, fairmindedness, and fair play on the part of his instructors, not only in words but also in actions, will go far. [*A graduate dean*]

In my opinion, the graduate professor could do much to make the life of the graduate student more pleasant and profitable as a prospective teacher by using him less as a slave or machine. [*The president of a state teachers college*]

In so far as the prospective college teacher gets his intellectual and social attitudes from the graduate school, these must reflect the character and preoccupations of the graduate school itself. Hence any effort to improve them particularly seems to me to call for considerable reshuffling of graduate school concepts. [*An assistant graduate dean*]

The answer to this problem lies largely in the type of faculty member offering the courses and in the general environment of the graduate school—but also in the careful selection of those who are admitted to the graduate school. [*A junior college president*]

Teachers in the graduate school, for the most part, are not themselves trained or developed in the respects here mentioned; improve them. [*A liberal arts dean*]

Have as graduate faculty members only scholars and gentlemen. Improve the faculty members and you automatically improve the Ph.D. candidates as persons. [*The president of a state teachers college*]

Certain details of graduate procedure

In addition to this initial topic that opened up many aspects of educational theory and basic objectives or appropriate scope, the questionnaire contained items calling for comment on a few other and perhaps less far-reaching aspects of current graduate practice. One of these had to do with requirements respectively for the Ph.D. in education and the Ed.D. degree. Opinion was

rather sharply divided here between those who saw no point at all to granting both degrees, and those who made a clear difference in their several functions. Many had little approval to offer for the ordinary procedure governing either degree, and there was fairly general recognition of the lesser esteem in which the Ed.D. is held. Interestingly enough, the division of opinion here did not follow occupational lines any more than was seen to be the case in the matters previously discussed.

In connection with the point about the needlessness of two doctoral degrees in education, some individuals were undisguisedly scornful. For instance, one graduate dean said he couldn't "imagine anybody calling himself a doctor of education; there should be no such degree," and another declared he knew nothing about the Ed.D., adding, "It sounds *ersatz* to me." Another person who did not consider himself "competent to judge," this time the president of a teachers college, was no less forthright in his opinion: "It seems to be generally recognized that the Ed.D. does not stand as high in social and scholastic circles as does the Ph.D." Others made the same point:

I see no value at all in distinguishing between the Ph.D. degree and the Ed.D. degree. The Ph.D. degree intrinsically means nothing in its title—it is merely the degree for advanced graduate work. The Ed.D. degree does not have the same status. It seems to me merely a confusion to attempt to run a double-track degree system. One of the degrees is bound to be of lesser value in any particular institution. [*A superintendent of schools*]

I am under the impression that the ranking of the Ed.D. degree is nothing like as high as that of the Ph.D. I am sure that in some institutions candidates who do not show sufficient ability or background to qualify for the Ph.D. are acceptable candidates for the other degree. [*A university dean of liberal arts*]

I presume the Ed.D. degree was developed largely to eliminate the research angle and the language requirement. [*A state superintendent of schools*]

One president of a state teachers college, on the other hand, thought that the Ed.D. degree might be used for educational pioneering and should certainly be given in institutions that have not "divested the Ph.D. in education of its traditional trap-

pings." Another pointed out that the "type of degree and the name of it is of no significance" provided the "curriculum and training are adequate for the purposes" in hand.

The individuals who appeared to be thoroughly convinced of the need for two educational degrees all differentiated between them in much the same way:

In our institution, the Ph.D. degree is primarily a research degree designed to prepare students for scholarly careers in research. The Ed.D. degree, on the other hand, is a practitioner's degree designed to prepare the student to be a successful practitioner of the highest level of competence. It is in education what the M.D. is in medicine. [*The director of a university summer session*]

In my opinion, both degrees should be offered for students with a major in education; the Ph.D. might be granted to those who had produced and might be expected to continue to produce research, while the Ed.D. will be given to those who expect to use or "consume" research. [*A university dean of liberal arts*]

The Ph.D. degree should continue to be a research degree and the Ed.D. degree should be a practitioner's degree. I see no reason why the same institution could not offer both degrees. [*A university director of laboratory schools*]

A few people—significantly enough, notably among the public schoolmen or "practitioners" of education—thought the distinction between the Ph.D. in education and Ed.D. degree was theoretical or fortuitous rather than fundamental:

I am familiar with the argument that the Ph.D. degree symbolizes training in certain fields of research not covered by the Ed.D. degree but I think this distinction is not inherent. [*In a system on the Atlantic seaboard*]

Some are able to acquire the Ph.D. degree easily while others must climb over almost insurmountable hurdles, all due to varying standards and requirements in different institutions. Theoretically, the holder of the better degree should profit accordingly. In practice this seems not to be true. [*In a system on the Pacific coast*]

A substantial group of people was highly critical of the way both degrees are administered. Without going into the question of whether the two degrees were really needed, they had a good deal to say about graduate procedure as such:

The research requirement for the doctorate is not well administered. More emphasis should be placed on a *critical* knowledge of a substantial portion of the literature of the field, including the current literature. If the emphasis were on *well informed* scholars, the research would I think, assume its proper place. [*A university dean of liberal arts*]

Specialists must learn to write of profoundly important things simply, and without a studiously contrived nomenclature which only the specialist is expected to command. [*The president of a state teachers college*]

There should be a liberalization of thesis topics. Our director of graduate studies, who recently completed work for the Ph.D. degree, tried in vain at several schools to get assigned to a topic from which he has since developed a scholarly book manuscript. Instead he was twice assigned thesis topics in which he had no interest; his doctoral dissertation has proved to be virtually a dead loss in his teaching. [*A university president*]

In general, Ph.D. requirements should be more flexible and adapted to the student's undergraduate preparation, ability, and future plans. He should be encouraged to study in departments related to the major which would broaden and enrich his total comprehension of the material in his field. [*A political scientist in a college of liberal arts*]

Greater emphasis on functional and less emphasis on relatively nonfunctional activities would enhance the value of the degree. [*A research director in the public schools*]

If I could I would de-emphasize specialization for the general college teacher and require a well rounded training and broad outlook on life. [*A graduate dean*]

I am opposed to too many conventional requirements, e.g., languages. We must learn to evaluate creative scholarship and contribution, not hang our degrees on specified, unimportant pegs. [*A university dean of liberal arts*]

More freedom to the individual graduate student to work out particular combinations of courses and fields, to meet what he wants to do with his training when he has formulated his plans. [*A graduate dean*]

The procedures for administering the Ph.D. degree or the Ed.D. degree are too ritualistic. [*The dean of a liberal arts college*]

Somewhat less emphasis on research and more on broad academic preparation and teaching fitness. [*A graduate dean*]

I would offer no specific requirement for the degree that did not have a functional relationship with the goals set up for the degree and the use that was expected to be made of this product. [*The president of a state teachers college*]

On no aspect of this subject was more eloquence displayed than that of languages needed for the doctorate. With few exceptions there was general agreement to the effect that the present requirement is utterly meaningless and should either be made significant or abolished:

I think the language requirement should be considered far more realistically. Where a man will need a language in research and in his future work, it should be required. If he needs any other special technique, such as statistics, testing, and the like, it too should be included in his requirements. [*A university dean of liberal arts*]

I am personally suspicious of the traditional language requirements for the Ph.D. There are many fields in which it appears one foreign language might be quite ample. It just might be that intensive digging in English would be better for one's teaching than intensive digging in foreign languages. [*A graduate dean*]

For most students I feel that the language requirements for the Ph.D. degree have become a mere hurdle without meaning. It takes time which should go to richer work . . . and constitutes emotional and intellectual frustration, leaving the student in the end with no real knowledge of the languages studied. If a student really needs one or more foreign languages he should study them thoroughly. [*A university president*]

Omit the superstition and farce of language except for language teachers. [*A teachers college president*]

I am not sure that we should continue to require the languages for the Ph.D. degree in any field. For many candidates language is an indispensable tool in research, but in many cases it has no value whatsoever. [*A graduate dean*]

The Ph.D. degree too often requires nonfunctional language tools which become mere hurdles. . . . The common practice of requiring French and German regardless of field is nothing but an anachronism. [*The director of a university summer session*]

I should favor a more honest language requirement for the Ph.D. A real ability to use *one* foreign language should be demonstrated by research requiring knowledge of the language. This *used* lan-

guage need not necessarily be Latin, French, or German. [*The president of a state normal college*]

I would either abolish the language requirement or make it mean something. I would require candidates to be able to read, write, and speak English before undertaking a dissertation. [*A superintendent of schools*]

Yes, if familiarity with the foreign language is necessary for the student to succeed in his graduate work. If not, I believe that the "disciplinary" value which results from cramming a foreign language might be acquired from learning something of more functional value. [*A university director of laboratory schools*]

I favor any language combination that can be justified as the most suitable tools of research. I favor the substitution for a language of some other tool when the major adviser can "show cause" for such a substitution. Again as elsewhere, the true safeguard to scholarly standards lies in the research standards of the graduate faculty and not in the enforcement of rigid rules. [*A graduate dean*]

Some specific applications

In order to make the discussion as meaningful as possible, the questionnaire called for an indication of curricular changes that might improve the graduate procedure in named fields of study. Certain individuals, though not very many, appeared to be perfectly satisfied with existing conditions. One graduate dean said the only field he knew well was mathematics and "if I were not already pretty well satisfied with the program there, I would be tinkering with it." Another saw "no reason for curricular changes in advanced programs." Still another seemed to be a bit apprehensive of change:

In my opinion, the best preparation for college teaching in any field of study coincides with the best courses in that field and the best training in modern methods of research. Curriculum changes . . . which would detract from the amount and character of the training in subject matter would, I think, effect a degradation rather than an improvement in collegiate teaching. [*A graduate dean of the humanities*]

But the great majority of graduate deans as of other educators, the "consumers" of the graduate product, thought there was considerable room for improvement all along the line. The

criticism most frequently offered of the training currently provided had to do with excessively narrow specialization:

Most English teachers are squashed out flat by the machinery of the graduate school and stay that way. [*The president of a junior college*]

In the fields of economics and public administration I think that much more attention should be paid to methods of research of all sorts and very much less attention to the writing of a dissertation. It is our experience that many people who have done a particular bit of research on a narrow subject know nothing about bibliography in general, nothing about how to handle material, nothing about mechanical aids to thinking, etc. [*A graduate dean*]

The programs in English put too much emphasis on the classical material, have too narrow a social content, and tend to turn out individuals who are misfits both in the world and in the universities. [*A university president*]

Less narrow specialization in each field. For example, we ask a man with a Ph.D. in history if he will take a class in American history since 1850 and he will hope to be excused since his advanced work made him a specialist in "the Constitution," "the critical period," or the "influence of the Jeffersonian school." [*The president of a state teachers college*]

In the field of educational administration I believe the resources of the university should be available in the study of public finance, engineering, and law as related to the administration of schools. [*A state superintendent of schools*]

For teaching a man should have a greater spread of subject matter than is at present allowed. Narrow specialization is good for research workers but not for teachers. [*The dean of a state college*]

As dean of a liberal arts college I quarrel with nearly all the training of people in all departments. For example, in the field of English in a medium-sized college such as this, the English teachers all have to teach composition. They get very little training in that. Each of the six persons in the department does some work in his own field of specialization, but each has to teach courses outside that field. In history the same is true. My suggestion is that the graduate school should see to it that a man has broad training in his field and then that he be allowed to carry some aspect of the subject into a very specialized area. [*A university dean of liberal arts*]

Those of us who are trying to do the general education job on the

undergraduate level are handicapped by the fact that we have practically to train our Ph.D.'s for the work. We cannot find them already trained in the graduate schools. [*The president of a liberal arts college*]

Various suggestions were made to help matters. One graduate dean called for "more survey courses" in order to get "backgrounds in perspective." Another complained that "most doctoral candidates have trouble with English; we've found no satisfactory way of correcting it." A staff member of a state department of education called for "dumping overboard about two-thirds of the sacred accumulation of the ages and requiring candidates to rediscover 'the fundamentals,' and to determine whether they are fundamental for *them*." Several persons put faith in greater knowledge of human nature:

A better understanding of undergraduate needs—both lacks and desires. [*A graduate dean*]

Graduate work for teachers in any subject field should include both a thorough understanding of human growth and development and mastery of a specialized area of learning. [*The director of research in a public school system*]

Others stressed the need for seeing a special field in its larger aspects and ramifications:

The chemists, though they have a much broader training than those in English, foreign language, or history, are trained to be industrial chemists not chemistry teachers. Very few have training, for example, in biology, physiology, or nutrition, in which fields there is a wealth of illustrative material that could be used to make their chemical teaching more functional. [*A university professor of botany*]

I feel very keenly that candidates for teaching positions in English who have Ph.D. degrees in that field should have a matrix of study in the political, economic, social, aesthetic, and philosophical life in which literature is set. It would seem to me infinitely more advantageous if the graduate schools spent more time giving their students such a background and less time in original research on some completely obscure author of the past or some fairly valueless point in philology. [*The president of a liberal arts college*]

Broadening the field of his interests so he can see his own specialty in its proper lights. [*A graduate dean*]

In this connection many persons put special emphasis on the contribution of education and the social sciences:

In almost all fields a study of the history of the development of the civilization which has accompanied the advance of learning in the special field would be very good. [*A graduate dean*]

It is my impression that most graduate departments give their students a good understanding of the important problems in their respective fields. But these students are often very weak in their understanding of the interrelationships with other fields. Perhaps what is needed is an over-all seminar in social philosophy in which all prospective teachers would participate. [*The president of a college of liberal arts*]

The dissertation requirements should provide for a broader and more comprehensive social and economic outlook. [*A graduate dean*]

In my opinion, preparation for college teaching would be improved if more emphasis were given to education and the social studies as a supporting minor. Oddly enough, most graduate schools are turning out teachers who have no background of theory, no interest in the educative process, or in the relationship of their subject field to a democratic order. [*The director of teacher education at a state college*]

Be sure he understands the importance of, and the elements in, social change. [*The president of a liberal arts college*]

The one requirement that I should make of all candidates for the doctorate would be a substantial familiarity with fundamental social and political philosophy. [*A graduate dean*]

Implicit in many of the statements already quoted is a demand for much greater realism in the university classroom and an awareness both of what will be expected of graduates on the job, and of the ordinary life that will surround them. This demand became quite articulate in a number of instances:

A realization that college and high school are only parts of the community whole, and that life does not begin after one leaves the college campus would do much to "humanize" the Ph.D. candidate for work in his community. [*The dean of a state teachers college*]

If there were in each department an awareness of the problems which confront higher education today, brought about through a general interest in the problems of teaching at the college level, I

think that we would have some improvement in preparation for college teaching. Some departments give absolutely no attention to this feature of graduate training. [*A graduate dean*]

Emphasis on interpretation and use of material as well as upon content. This emphasis should be given in regular courses rather than through professional courses in education. [*The president of a college of liberal arts*]

Course offerings, even though they penetrate deep into the background of [the several] fields, must continue to relate these understandings to present—and present unsolved—problems. [*The president of a state teachers college*]

Chemistry and physics teachers should work in commercial jobs for at least six months. [*A high school principal*]

There should be a preliminary requirement of successful experience in teaching on the freshman and sophomore level. [*A graduate dean*]

It seems that we have reached the time when consideration should be given to making a distinction in the program of work outlined for the individual who is looking forward to research and the one expecting to teach. In the latter case, we might place less emphasis upon the high degree of specialization and endorse a somewhat broader program of study. [*A graduate dean*]

Certain educators who sent in statements appeared to be well aware of the criticism and line of reasoning voiced above, but were far from sure the suggested remedies were adequate to the situation. One graduate dean, for instance, mentioned that in his institution Ph.D. degrees had been granted that cut across departmental barriers and touched on the specialties of several academic fields; he ended by asking somewhat wistfully: "Where will these candidates later settle down professionally?" Another, after conceding that graduate schools did little more than prepare "technical experts in a given field," and that "this alone will not make a student a good or even an acceptable teacher," went on to admit: "Frankly I do not know what curriculum changes are needed for the other part of his preparation." A university dean of arts and sciences, who is also a zoologist, pointed out a danger in the very breadth which some of his colleagues had advocated: "Zoology has become so highly ex-

perimental that many students, under pressure for a maximum amount of training in chemistry and physics, have not learned as much about animals as they need to know as zoologists."

Several graduate deans, on the other hand, indicated that certain promising changes were already under way in their institutions. These usually took the form either of broadened scope of graduate work or an emphasis on individually directed study. A few statements will serve to illustrate:

There is a tendency here to broaden the scope of doctoral dissertations to include theses of a documentation and essay nature. There is also a tendency to cut across traditional academic boundaries. Sociologists sit on the thesis committees of physical education and psychology students, and psychologists participate in the direction of engineering students.

Some of our students do practically all of their work in directed study and research; in the past most of the work was done in courses. Personally, I think the trend is toward greater emphasis on such directed study.

On the whole the time spent specifically in candidacy for the Ph.D. degree is largely given over to independent work in which a student is advised by his instructors but is left mainly to his own resources. Only in this way can we develop independent scholarship.

Interdepartmental degrees are provided when the student's interests overlap more than one field of scholarship.

From the entire discussion presented so far it will be seen that, while there is little evidence of anything but floundering when it comes to remedies, there is very widespread and deep-running dissatisfaction, among these educators, with existing conditions in higher education. This conclusion is as true for the graduate deans as a group as it is for the college administrators. The several viewpoints of "producer" and "consumer" are not held steadily or consistently by either category, many individuals indeed speaking in both capacities or—notably among the schoolmen—apparently in memory of their own graduate experience. Despite the many crosscurrents of opinion, at least one basic divergence stands out with considerable clarity: the majority of these educators were feeling for some way

of broadening or humanizing the average graduate student—often by means of firsthand experience with people or actual social conditions, but a substantial minority was reaching in the direction of more thoroughness and intensive intellectual discipline as the way out. This divergence was brought out again by the items on the questionnaire dealing with possible procedures in graduate personnel work. These will now be examined in some detail.

PERSONNEL PROCEDURES

In general, the same major lines of thought were made explicit in discussing personnel procedures as appeared in connection with the matters already presented. It will consequently not be necessary or desirable to illustrate to quite the same extent. Many of the statements made are nevertheless of considerable interest. The question, for instance, of whether or not graduate schools had any special responsibility for the emotional and physical well-being of graduate students, on the one hand, or for their social participation in community life, on the other, provoked very different reactions.

Many educators emphasized that original selection for admission should cover factors of physical, mental, and social health as well as intellectual ability. In the words of one teachers college president, "eliminate the queer ducks" from the beginning. Many others, however, pointed out that the actual process of securing a doctor's degree was frequently almost too much for the average student to handle with poise and balance:

The mental health of graduate students often is bad. Very often they are under stringent financial pressure, their social life is practically zero, and sometimes in addition they have family worries besides the usual concerns of their programs and studies. This situation calls for careful organization . . . with provision for social work, satisfactory living accommodations, and careful and sympathetic advice. [*A university president*]

These are important points. Ordinarily graduate students need more care, such as a good staff of doctors can give, than do undergraduates. [*A graduate dean*]

The great stress under which most graduate students work has a tendency to undermine their physical condition and to make them emotionally unstable. A good psychiatric service should be a part of every graduate school. [*A personnel dean at a university*]

I have seen many physical and mental breakdowns among Ph.D. candidates. They certainly should be examined periodically by competent men. [*A college professor of chemistry*]

I have known several cases indicating that health is sometimes broken by work and worry for the higher degree. Provision should be made for frequent checks on health, exercise habits, and the like. Outlets for emotional strain should be deliberately planned—recreation, entertainment, free and easy social discussions, singing, etc. [*The president of a state teachers college*]

In too many cases, the program of the graduate school and the exactions imposed by it are destructive of the qualities here desired. [*A superintendent of schools*]

To my knowledge, graduate students must neglect extracurricular activities and social contacts in order to prepare better for examinations. [*A superintendent of schools*]

A few junior college presidents thought, on the other hand, that recent graduates showed less maladjustment than some older members of the staff, while a university president similarly considered graduate students often "more stimulating intellectually and socially than a large proportion of the faculty." The director of research in a public school system thought that "cooperative planning of the candidates' programs in such a manner as to avoid the undermining of health and the frustration of failure" would be "more appropriate" than elaborate health and social facilities.

Most of the educators who sent in statements advocated some sort of recreational and medical service for graduate students, and in a substantial number of institutions such provision, in varying degrees and with varying success, was reported as being made. Besides, a good deal seemed to be going on informally, especially in a social way, through the efforts of individual departments or professors. The value of expert guidance for graduate students was likewise emphasized. The composite impression left by these reports is, however, spotty and inconclusive. It

is also true that a very different viewpoint on the whole matter was expressed in no uncertain terms:

When people reach that level they should be able to look after their own physical, mental, and emotional health. [*A graduate dean*]

The best things are not taught: they are learned by inspiration and imitation. Fancy having a group of students come to your house to be initiated into good manners and deportment; what a miserable setup! [*A liberal arts dean*]

A university is not a sanitarium and the individual must learn some time to solve his problems with no more help than he will get when he is finally out in life. Why not begin in the graduate school? [*A university dean of arts and sciences*]

Little is done to introduce the graduate student to the cultural life of the community. To dilute a sound graduate program with an attempt to develop broad cultural interests is an unwise procedure. [*A graduate dean*]

To be sure, he has little time for such distracting side issues, but some attention should be given to normalizing his life. [*A university president*]

It is felt that the student cannot suffer from the distractions of outside life and do as well with his graduate work as he should. It is extremely doubtful if any sharing of their time with the extramural life of the community would have value for them or for the community. [*An assistant graduate dean*]

Such things can be overdone and become an annoyance to graduate students rather than a help. Their time is usually budgeted very closely. [*A graduate dean*]

A large proportion of the graduate deans indicated that their institutions made no special provision for assistantships or fellowships for graduate students who were known to be actively preparing for college teaching. Some were not clear that the award should be made on any such basis since "students ordinarily have not made such a decision," i.e., to go in for teaching rather than research, "when they enter the graduate school." On the other hand, other graduate deans seemed to think there was a real educational opportunity at stake here:

I would like to see the systematic development of a plan by which skilled college teachers would have always a teaching college apprentice under their wings.

We have about 150 teaching fellowships and an equal number of assistantships. I recommend control to see that all prospective teachers get this opportunity.

The dean should stress the responsibility of his staff in handling their assistants. Perhaps a report from departments should be required.

I believe some attention may be given to the teaching demands which an individual is likely to encounter after receiving his degree.

It would be very desirable if institutions could offer special fellowship support for such students.

It obviously would be wise to appoint to teaching assistantships those who are known to have that objective, if they also have the ability.

Other educators—on the “consuming” end of the graduate process—were at least more incisive in their suggestions, although relatively few of them felt moved to say anything on this subject. Most comments had to do with the basis of selection for fellowships or assistantships, as far as prospective college teachers are concerned, and with their value for student growth:

Consider the total personality, not only intellectual attainment; do not use these people as drudges but as learners. [*A university dean of liberal arts*]

When a fellowship or an assistantship is granted a candidate, let that be a means by which he will learn how to teach, counsel students, do committee work, organize courses, etc. [*The president of a state teachers college*]

I think such aids to graduate work should come only after the student has proved himself; naturally this would break into the racket of subsidized graduate students as now practiced. [*A university dean of arts and sciences*]

More will be said on this general topic in the next main section of this chapter, in connection with opinions on the value of professional courses and student teaching in preparation for college positions.

In contrast to the usual situation, there was on the subject of placement and follow-up of young doctors of philosophy a very definite and quite marked difference of viewpoint, as between

the graduate deans and the "consumers" of their product. Most of the former were only barely interested in the subject and were content to leave such matters to the several departments or individual professors:

My impression is that graduates take a job in whichever institution makes the first offer.

No problem of placing Ph.D.'s—only one person not placed: a hanger-on we were unable to shake out, forty years of age, very mediocre personality.

Each department finds it easy to place its doctors; no organized effort seems to be needed.

We have a placement bureau. However, much of the responsibility for placing our students in college positions lies with the staff members of the department concerned.

It is only fair to emphasize an exceptional case in which the dean's office was said to refuse "to advance candidates where it seems that because of poor personality, or social background, or poor combination of interests, their placement will be hampered." That most graduate schools, whether they operate through placement bureaus or not, have little trouble in finding positions of some kind for their doctoral students is clearly substantiated by the available statistics. As shown in Chapter II, there was very little actual unemployment to report among those people who secured either the Ph.D. or Ed.D. degree during the decade 1930-31 to 1939-40, though some of this employment was in work not consonant with preparation for the doctorate. On the other hand, there is another side to this picture, as may be seen from the following statements:

I think I could give the graduate school a great deal of advice. I have been picking college teachers for over twenty years and it is a headache. I should like to see someone in the graduate schools who could tell me with a degree of assurance that this candidate has personality, that he would be a reliable teacher, that he has force, that he can cooperate, that he has broad education in his own field, that he knows a great deal about higher education, and that he has his own definite convictions about what he wants to do in the formulation of policies in college. [*A university dean of liberal arts*]

I suggest that placement officers make a greater effort to know the characteristics of the institution to which they recommend people, and the personality as well as the intellectual qualifications of the candidates recommended. [*The president of a college of liberal arts*]

The placement problem is closely tied up with the eminence of the staff members who are directing the studies of the graduate students and their field contacts. Generally speaking, I feel that staff members in graduate schools are too far removed from the world of affairs and for this reason are unable to be of great assistance in placements. [*A university president*]

I have never felt that a university should be a placement bureau and the antics of some institutions in their efforts to place students are ludicrous as well as annoying. One who is on the employing end of this game also gets pretty suspicious after some of the experiences he has with the heads of departments in the larger institutions, who have a crop of graduate students to work off every year and who seem to have little conscience in their recommendations. [*A university dean of arts and sciences*]

It is hard to determine whether the candidate meets your requirements or whether he is a favorite of some university professor who is pushing him in order that the individual might secure the position. [*The president of a state teachers college*]

Graduate schools do not understand the junior college. Placement officials and graduate professors recommend their students on insufficient evidence. Their comments are not helpful. Too much praise. They seem to be unwilling for their students to begin at the bottom. [*A junior college president*]

Too often the placement bureaus of graduate schools have recommended to me people who are either almost entirely research men or people who have had many courses in education but do not have an adequate background to teach in the specific field in which they expect to teach. [*A junior college president*]

Several individuals warned of the dangers of reckless overproduction:

Prepare in accordance with possible demand. Do not oversupply. In education we must get rid of purely business considerations based on advertising, unwise recruiting, lowering of standards, etc. [*A liberal arts dean*]

Graduate schools will do themselves a great service if they refrain

from overproduction of graduates for the doctor's degree. There will be no overproduction if only those people are admitted who have real potentialities for leadership in their fields. [*A superintendent of schools*]

Place graduates *only* where they will fit; fewer and better graduates. [*A superintendent of schools*]

Others stressed the value of closer contact with the field and with graduates on the job, often as a means of improving the graduate program itself:

I believe that each department should have some member who could devote part of his time to placing Ph.D. graduates and in following their careers for a few years to see that they are satisfactorily employed. [*A college professor of chemistry*]

In no way can a college discover the "bugs" in its system to the same extent as it can by keeping track of the success of its own product. [*The dean of a state teachers college*]

I would suggest that departments granting the degrees take more responsibility for the proper placement. It is probable that quite a number of modifications in the program for the doctorate would be made if those who guide the graduate work could see their products in action and could have frank statements from them of their experiences in the first positions held. [*A university dean of liberal arts*]

A successful placement program demands that an institution be alert to prepare candidates in fields in which there are likely to be demands for service. An institution must weave itself into the fabric of its locality, placing many students in internships even before they are graduated. [*The director of a university summer session*]

Maintain closer contact with potential employers through services rendered—in any type of research or other assistance that can be given at any time to them. [*A staff member in a state department of education*]

The graduate schools are giving their students a false outlook on what the colleges and universities really demand of prospective teachers. This failure makes the first years very difficult for the young college teacher. It takes four or five years of in-service training to make good college teachers, and many of them can't take the training. Consequently they never amount to anything. [*A university dean of liberal arts*]

Not all comments were completely unfavorable on this head although the prevailing mood was certainly critical. A university director of laboratory schools thought that "faculty members who are interested in follow-up and placement do a good job," while others "who do not feel so keenly that it is their responsibility do a poor job." The president of a college of liberal arts pointed out that "there are just a few graduate schools which do an excellent job of aiding administrative officers in selecting candidates for teaching positions," and wished that their procedures might "be studied and publicized."

This widespread dissatisfaction with placement is obviously a criticism of the graduate program itself. As a matter of fact it is clearly part of that major groundswell of unfavorable opinion which was sketched in the previous section of this chapter, and which in an effort to improve quality appears to be driving with gathering conviction toward contacts of every sort with life as Ph.D. graduates must actually live it. Interestingly and perhaps somewhat curiously enough, while the graduate deans and the collegiate administrators were seen to be clearly aligned against each other in the matter of placement, there was no such clear-cut division—as was repeatedly demonstrated—on the closely related issues presented above.

The topics on the questionnaire that still remain to be discussed, were formulated with an eye on emerging practice aimed at closing the gap between campus thinking and ordinary human existence. It will be interesting to note how opinion lines up on these matters.

THE DOCTORATE AS PREPARATION FOR TEACHING

Direct preparation for the teaching profession, in addition to mastery of a chosen field of study, is usually taken to include some introduction to methods of teaching, knowledge of how learning takes place, adolescent psychology, and the place of institutions of education in the total culture. Even the most conservative educators usually admit that all of these things are important although they differ very radically from some professional educationists as to how they are best imparted or whether,

indeed, some of them can be taught at all. Opinions of every shade were secured by the instrument for this study and will be briefly presented.

Student teaching and professional courses

The practice of using graduate students as assistants for class-work or in the laboratory is fairly widespread in American universities. While the estimates furnished by graduate deans on the number of prospective teachers who had had "acceptable college teaching experience" by the time the degree was awarded, varied from "a very small percent" to "practically all," the majority ran from 50 percent up—usually considerably higher. The statements of many educators have already been cited to indicate the importance attached to such experience—practically always in the home institution—as induction into the profession or a potentially important phase of the student's personal development. There is, however, very little evidence to suggest that, despite a few outstanding exceptions, student teaching at this level is regarded as more than a convenience to students and professors alike.

The questionnaire asked specifically for a judgment on the value of "student teaching done in a college or junior college under supervision of the graduate department" as part of the prospective college teacher's preparation. Opinion was found to be as sharply divided, and to cover as wide a range, as has been found to be the case so far on most issues discussed. Nor is there any tendency for a special viewpoint to predominate among educators of a given occupational classification:

We attach great importance to the use of part-time assistants who, through staff contacts, develop as persons and in the mastery of their fields of specialization. [*A graduate dean*]

This project reduces the function of the graduate school to that of the teachers colleges in which there is not, and cannot be, the strictly cultural work proper to a graduate school. [*A university dean of arts and sciences*]

Most teachers in the college field have developed their methods through the bitter school of experience. I shudder to think of the

crimes that have been committed in the college classroom by men, experts in their fields but neophytes in their methods of instruction. [*A university dean of students*]

There are so many teachers with the doctor's degree who still cannot teach that the importance of some such apprenticeship and evaluation cannot be overlooked. [*The dean of a state teachers college*]

Student teaching at this level is of little significance; appropriate field experience is valuable and significant when it can be arranged. [*A superintendent of schools*]

Most teachers have had too much so-called "professional" stuff already. [*The dean of instruction in a junior college*]

While several educators, largely but not exclusively graduate deans, were concerned about "weakening our undergraduate instruction by turning our college courses into practice-teaching units," most of them saw theoretical value in student teaching but were skeptical of the actual results obtained. Some of them pointed out that supervision was not always adequate and others questioned the qualifications of the graduate department even when it took this responsibility seriously.

Very important if competent supervision is available, but mere practice doesn't make perfect. [*A graduate dean*]

I am not greatly impressed with the teaching experience which a student gets in the graduate department of any university. Such experience merely leads him to continue the practices which prevail in his department. [*A graduate dean*]

It is too often done by the student as an extra burden and without supervision; such learning as takes place is incidental. [*A graduate dean*]

I think that when possible teachers in training should have the opportunity to observe the work of inspiring and able teachers; I know that the details of working out such a program are difficult. [*A university dean of liberal arts*]

I am very skeptical of apprentice teaching under the supervision of most graduate professors. I know very few who are themselves sufficiently good teachers to be valuable in that role. [*The president of a liberal arts college*]

Very important if conditions make it possible to do a good job.

Such conditions do not now exist at this university—nor I suspect in many others. Professors as a rule are not interested in serving as critic teachers—many also lack sufficient breadth of experience. [*A graduate dean*]

Yes, if a graduate department has men and women qualified to supervise graduate student teaching; however, many of the professors in graduate schools are not howling successes as teachers. [*The dean of a college of liberal arts*]

Student teaching as a basic educative experience is important. Unfortunately, too much of this experience has been provided in situations quite different from those in which the student finds first employment. [*A college president*]

Several individuals considered it important that prospective college teachers should have preliminary teaching experience of some kind but not as part of their graduate work. One college president thought "student teaching should be encouraged but not required," while a graduate dean preferred "that teaching experience be gained in the summer." Several educators advocated making preliminary teaching experience a prerequisite for registration for the higher degrees. Another graduate dean believed "student teaching under supervision" to be "excellent training, but I do not consider it a necessary or even a legitimate part of a doctoral program."

Opinion was more uniformly (though again not excessively) adverse on the subject of professional courses other than student teaching. Graduate deans and college administrators alike tended, on the whole, to disparage offerings of such a nature. Many of them added that only education majors ever took advantage of the opportunity when professional courses or seminars were planned. Yet a good many thoughtful educators seemed disturbed by this situation without being too clear about the nature of the difficulty or its remedy:

The Ph.D. centers so definitely on the subject-matter areas (such as chemistry, English, etc.) that any injection of the problem of instruction, or the problem of understanding the educational system, comes in almost as an annoying extraneous factor. It would only lead to a thorough contempt for professional training on the higher levels. I do think that college teachers should have such

professional training—but I think that the Ph.D. route is a very inadequate procedure for developing good college teachers. [*A graduate dean*]

In my opinion very little could be done by establishing additional courses. What is needed, it seems to me, is a sensitivity to [educational] problems which can come about only through long preparation within individual departments. [*A graduate dean*]

While little dependence can be placed upon specific requirements, the fact remains that any teacher should have knowledge, appreciation, and understanding of the educational system; he should know something about the persons whom he expects to teach; he must be able to plan his courses and to teach in a satisfactory manner—making appropriate use of special techniques such as visual aids. [*A state assistant superintendent of schools*]

I have no specific education courses to recommend but believe that every prospective college teacher should have an understanding of the educative process, the nature of the human organism, and some conception of the role of education in modern society. [*A university president*]

A university dean of arts and science very probably came nearer to saying what seems to have been vaguely bothering most of the individuals just quoted, when he drew up the following statement:

The thing that troubles me about education, and which presses itself upon us on every occasion, is the obvious limitation that it deals with the form and not the substance of reality, so to speak, and the fact that men in education are seldom themselves the outstanding teachers in any institution. I have been trying to have some real respect for the performance all my life and still hope I may live to see the day [when I can] despite some recent experiences that have been very dispiriting.

The question of professional specialization

To make the discussion specific, in much the same way as was done before in connection with named departments of specialization, the questionnaire directed the argument about professional courses to particular levels of education. This was the case in the enlarged and adapted versions of the instrument sent to graduate deans and junior colleges. Again opinion was found

to be sharply divided. Many of the graduate deans rejected rather vigorously the idea of trying to prepare teachers for specific types of institution:

Personally I do not see much difference in the training for teaching in various levels. Success anywhere depends on adaptation of material and the flexibility of the professor along with whatever specific courses he can find pertaining to the level selected.

I do not see any reason why work for the doctorate should be varied according to the level of teaching anticipated. The Ph.D. degree should be evidence of certain scholarly attainment.

I do not think graduate schools should cater to a particular market. In my opinion they should try to turn out men who are adaptable to any kind of college or university teaching. They are not likely to stay in one job always; they should be able to work with understanding at the various college levels. Even in the case of engineers we find graduates of one branch of engineering in a different branch after a few years of practice, and this is as it should be. In the field of higher education, the training of teachers should be both broad and thorough.

Some were definitely suspicious of any special adaptations:

If an adulterated program is to be provided to train people for work in junior colleges it had better be given a distinctive label. There is, however, no reason for supposing that the present doctoral program makes a teacher unfit for junior college work.

I am very much opposed to offering supposed graduate work which is of a type distinct from what graduate work implies. If some other type of work is needed, let this be cared for by professional schools giving professional degrees.

A few seemed to resent the conception of the doctorate as a *teaching* degree:

I should regret a trend on the part of the junior college to demand Ph.D. training—this being based largely on research little of which can be done in junior colleges.

Some candidates are too old—past thirty—for research institutions to be interested in them. Consequently their pattern of training should be adapted to junior and four-year colleges.

The Ph.D. is not and should not be regarded primarily as a professional degree.

On the other hand, in contrast with all of the above, many graduate deans fully approved of the principle involved in preparing teachers for different collegiate levels:

It would be well if some of the graduate schools would recognize the need for the preparation of junior college teachers and for the offering of courses for the advancement of those who are doing work in this area.

I think we should take these different levels into account and advise our students accordingly. It is obvious that students with the greatest scholarly aptitude and creative ability should be encouraged to go into university positions where they may add to our fund of knowledge; while those with a more social outlook and less scholarship and less creative ability might be placed in the junior college position. I should say that the great majority of our graduate students should be encouraged to take up work in these fields of the junior college and the small college because of the greater number of positions—and the number of students fitted for university work is necessarily small. I do not wish to imply that the lower levels of work are in any sense less important.

Several graduate deans approved the principle but had reservations of one sort or another.

I am inclined to feel that a series of courses in psychology, sociology, mental hygiene, personnel, and vocational guidance could be offered that would materially help placement in junior colleges. However, there is a danger of courses *about* junior colleges rather than rich content of the subject to be taught.

I think that graduate schools should cater to this [differentiated] market provided that, in so doing, they do not sacrifice the freedom of the graduate student to adjust his career to his own developing interests.

By all means [differentiate]—but it will be just as hard to get universities to do so as to get teachers colleges to prepare teachers for rural schools.

Some institutions may well give the junior college field especial service. But not all institutions need to do this—especially in the east.

We agree that the junior college bids fair to be important but we are not sure that it will continue to represent *college* teaching as we have known it. The rate of growth of terminal-course students

in junior colleges, extension and adult work, etc., tend to make the junior college more like the high school.

Turning to the representatives of junior colleges, much the same range of opinion is discovered among them. One dean said he much preferred "teachers who have had [preparatory] work of this nature" since "they at least know what a junior college is." Another thought professional courses "could be valuable if given by people with actual junior college experience." On the other hand, a third dean pointed out that "live teachers" can "pick up such matters . . . on the job" although he conceded that such courses "could be superior to much that is now ladled out" and "would be a desirable substitute for some of the fluffier fluff." A junior college president, however, made no bones about thinking "it much more desirable that the prospective junior college instructor have a broad background of general philosophy, history, and literature in addition to his or her particular field, than . . . a preponderance of professional courses of the type indicated."

Adolescent psychology and counseling

The remaining group of issues to be discussed has to do with the prospective college teacher's understanding of young people and ability to help them with their personal, academic, and vocational problems. Possibly because these matters came at the end of a fair-sized questionnaire, or possibly because interest was not very spontaneous, relatively little was said on these subjects by the educators that contributed to this study. However, the usual main divergence of opinion was distinctly drawn in such answers as were forthcoming. As was to have been expected, some people saw no point to formal preparation in these areas. One graduate dean said he "hadn't the slightest idea" how graduate students can be given a "working knowledge and understanding of the adolescents whom they will teach," and there were others to make much the same implied point:

This has seemed unnecessary. Contacts on the job plus the memory of their own problems would seem to be a better solution than any institutionalized attempt. [*A graduate dean*]

Most of the knowledge we have today about adolescents is pure textbook statement and not working knowledge at all. [*A college dean of liberal arts*]

Graduates should be taught to view the average adolescent as fairly normal and not as something to work on with strange methods. [*The president of a state teachers college*]

If the teacher has a real liking for young people and a real interest in teaching, he will get this knowledge himself. [*A graduate dean*]

The dean of a university college of arts and science conceded "this is a real problem," adding the suggestion that the "basis for training should be the example of competent undergraduate teachers on the staff of the department." Again, a professor of psychology pointed out that most graduate students "were not themselves typical undergraduates" and consequently do not understand "the undergraduate's point of view in a way that is necessary for effective teaching." While a few persons who advocated action in this area relied mainly on course work, most of the suggestions made covered firsthand experience of many kinds:

We offer fellowships carrying board and tuition in return for residence in undergraduate halls and aid in routine administration and discipline. The graduate student is thus kept in touch with undergraduate life and learns how to handle college students. This is supplemented the following year by a small instructional responsibility. [*A graduate dean*]

By actual teaching experience and work with the university and college guidance and counseling services. [*A graduate dean*]

Universities must find situations in which candidates may work and play with adolescent groups. At the same time opportunity must be given for them to discuss their activities and the behavior of adolescents with persons who have a sound background in human development, and who also have shown ability in working directly with young people. [*A college president*]

Most graduate schools are in institutions with undergraduate divisions; there are plenty of adolescents on the place. Many classes for adolescents are being taught by people who are on the way to getting their degrees; they are learning by trial-and-error, hit-and-

miss methods. Why can't the graduate schools take the training of college teachers as seriously as the medical and dental schools do the training of practitioners? [*A university dean of liberal arts*]

The prospective Ph.D. or Ed.D. may learn about adolescents from scientific contributions but he should also be advised to read Tarkington's *Penrod* stories, William Allen White's *Court of Boyville*, and similar literature; to examine some of the popular comic strips; and especially to associate firsthand with boys. [*A state assistant superintendent of schools*]

Have them run a summer playground or do settlement-house work. [*A high school principal*]

The questionnaire's plea for suggestions as to what the graduate school might do to prepare students for "committees and similar faculty services" or "field work in the immediate or remote community" met with little positive response. The prevailing view—held by educators of all classifications was that such matters are simply not the graduate school's business.

IN CONCLUSION

Thinking back on the entire discussion of this chapter, it may be said that three fairly distinct points of view were discovered among the educators consulted. First, there were those who held rather aggressively to the traditional and somewhat aristocratic conception of graduate work, with major emphasis on rigorous intellectual discipline as the best means of access to those cultural values which all agreed were important. At the other extreme were the enthusiastic advocates of firsthand experience, human relations, and direct cultural experience as the only sound way to develop breadth and understanding. All would doubtless concede that mastery of subject matter was essential but the second group was very sure that such mastery did not hold the key to the other values as the traditionalists claimed. Between these two was a fairly large group of deeply disturbed educators who, while agreeing with the second group in most respects, were definitely skeptical of the efficacy of their procedures. It is interesting and significant that each viewpoint appeared in every classification of the educators studied; the only

question on which "producers" and "consumers" of doctoral graduates were clearly aligned against each other concerned the adequacy of placement procedures.

Finally, it should be reiterated that no quantitative significance should be attached to the sample of opinion here analyzed. It may or may not represent the total situation as far as numbers holding any one viewpoint are concerned. But inasmuch as many of the country's most influential educators are represented, the sample is certainly of considerable importance and merits consideration.

VI

The Opinion of Graduates in Active Service

AS ALREADY MENTIONED, several local studies bearing on the questions taken up in this inquiry were placed at the Commission's disposal. They have to do with departmental rating procedures, student opinion on the teaching ability of faculty members, letters from employing groups on institutional placement service, follow-up studies of former graduates, and the like. Three of these studies, aimed at getting evaluations from active college teachers of their own experience in graduate school, will serve to round out the discussion here presented. All three were stimulated, in one way or another, by some phase of the Commission's program.

SOME COLLEGE TEACHERS IN THE EAST

The first of these supplementary inquiries, made during 1941-42, consists of questionnaire returns and accompanying statements from 123 recently appointed persons serving on the faculties of universities, colleges of liberal arts, and teachers colleges in the state of New York.¹ As a group they represent a wide range of experience since their doctoral work was done in twenty-five different institutions and their fields of concentration covered mathematics and the natural sciences (36), education (27), history and the social sciences (25), the humanities (22), psychology (5), and a variety of special fields (8). At the time of the study, 85 were teaching in academic departments either in liberal arts institutions or teachers colleges, 24 similarly in departments of education, and the remaining 14 were

¹ These data were collected by Harold E. B. Speight, who was at the time jointly employed by the Commission on Teacher Education and the Association of the Colleges and Universities of the State of New York.

teaching such special fields as physical education, art and music, commerce, engineering, and speech.

The questionnaire to which these individuals responded grew out of comments spontaneously offered from time to time, to the effect that many college teachers had been compelled to specialize in their graduate work to a degree which had actually disqualified them for successful college teaching, and particularly for service on policy-making committees. The charge had been heard that work for the doctorate tends to nullify the benefits of the earlier liberal education and to produce a mind-set hostile to broad views, cooperative action, and concern for the total development of undergraduates as persons. The assumption should accordingly be fairly safe that most of the severe critics of recent graduate practice would seize the opportunity to contribute their views to the study. There is reason to believe that many of them did. At the same time, the majority opinion recorded was by no means as unfavorable as the initial contacts suggested.

For instance, in response to a question as to whether or not the required graduate work had, at the time of filling in the questionnaire, "seemed relevant to an anticipated career of college teaching," 79 of the 123 answered that it had, 26 qualified their affirmative reply, and only 18 were sure it had not. Again, 72 said that the "conditions under which the graduate work had been done" had definitely contributed to their own later success, 16 had reservations, and 25 answered unequivocally in the negative. Furthermore, 88 maintained that they had formed the judgments expressed during the period of graduate study and had not had to revise them later in the light of experience.

When asked whether the emphasis on research techniques had proved valuable later in their work as teachers, 89 said it had and 12 thought so with some reservations. Only 10 were clear that it had not but 12 persons failed to answer this question. Those replying affirmatively usually specified such values derived as the following: initiative, critical ability, accuracy, completeness, confidence, "techniques for interpersonal rela-

tionships," "integrity of reasoning, caution and discrimination," and "more appreciation of other studies." A request to name such experiences (whether part of the formal graduate program or not) as had had a bearing on the tasks later encountered in college teaching, elicited a wide range of testimony. The items mentioned most frequently included teaching and laboratory assistantships (43); seminars involving presentation and criticism of research, departmental clubs, and discussion groups (19); informal contacts with other students and faculty-student gatherings (16); and personal acquaintance with eminent scholars (14).

The questionnaire contained what was meant to be a leading question on "what graduate schools might do to interest graduate students (who intend to be college or university teachers) in methods of instruction, types of examination and evaluation, recent developments in higher education, curriculum problems, etc." As was to have been expected it brought forth many vigorous comments, both for and against the implied policy. While 90 of the 123 persons advocated that graduate schools provide instruction, or discussion, or practical experience in the suggested fields (and in others besides), 16 definitely opposed such activities. Only one negative answer as contrasted with 40 in the affirmative was received from the professors in teachers colleges; those active in institutions of liberal arts were more divided: 50 for and 15 against.

Some of the statements sent in with the questionnaire are well worth reproducing in this connection; they were inspired by one or another of the questions presented above:

To my mind, the successful teacher is not the product . . . of calculated plans by institutions, much less of courses in how to teach (although I have had plenty of those). My own belief is that college teachers needed to be kicked around *more* on the way up the ladder, not less. Most of what sense I have acquired seems to me, at any rate, to have come from rather painful experiences when I was thrown on my own resources and had to come through. I should therefore favor any scheme that would make it as hard as possible for students to come into college teaching directly from undergraduate work.

I can think of but one thing my graduate study did with a more or less deliberate purpose to prepare us for teaching. One semester a group of undergraduate students asked the department to offer a course which would be a survey of the different fields of psychology. They had all had the elementary course and there was little offered for them that wasn't a preparation for graduate work. These students did not plan to major in psychology, but they were quite serious students and wanted something more than one term. No one of the staff was prepared to offer such a course but, hearing about it, several of us [graduate students] thought it would be fun to give it. With the help of one of the members of the staff we outlined a course, got it approved in the office, and then each of us taught one section of it—a field in which we were specially interested . . . I can't recall that anything very specific was learned from it, but the feeling of standing before a class, of having to plan lessons, work out assignments, etc., was helpful.

All of the things you mention [in the leading question last cited] could be made vitally interesting to the young instructor, who always goes into teaching without knowledge of any of them. If he is, for example, in English, he hears nothing of curriculum problems; what he knows of examinations he has gathered from taking examinations, ordinarily made out and given by men who know nothing of evaluating examinations—ten questions with 10 percent for each question seems the easiest solution. Every prospective teacher needs to know something of administrative problems, even if he never even manages to become chairman of a faculty committee. He should know something of the mysteries of the registrar's office; he should know something of personnel work; he should know something of student activities, something about student health problems, student adjustment to college life. I do not mean to indicate that he need be an authority on any of these (or many other phases of college life), but he should know that college means more than the competent meeting of classes.

I welcome the emphasis on teaching ability but I feel that the Revolt of the Angels may take us too far in the direction of scoffing at thorough orientation in subject matter.

SOME COLLEGE TEACHERS IN THE WEST

A very similar study was conducted early in 1941 for the state of California.² President Roberts of the San Francisco State

² These data were gathered by Alexander C. Roberts and placed at the disposal of the author.

College obtained very frank questionnaire returns with accompanying comments from 50 out of a total of 57 doctoral graduates currently serving in the public colleges of his state. The individuals concerned were largely in their late twenties or thirties when they received their degrees, and the graduate work had been done in eleven universities—for the most part in the same state. As a group, these faculty members ranked high in scholarship during their period of preparation: 16 were members of Phi Delta Kappa, 12 each of Phi Beta Kappa and Sigma Xi, and 5 of Kappa Delta Pi. Besides, 20 reported membership in honorary societies of academic departments and 8 completed their undergraduate work *cum laude*.

The composite evaluation of their graduate experience made by this group was essentially the same as that reported by their eastern colleagues: rather hearty approval from the majority with strong disagreement from a minority. Thus, 36 of the 50 individuals claimed to have had sympathetic guidance during their graduate work, 41 had found their doctoral committee satisfactory, and 45 had not been delayed by the absence from the campus of professors essential to their study. The contrary opinion was, however, consistently vigorous, one individual adding on the question last cited: "It would have been better if some of mine had been away indefinitely."

An effort was made in two parts of the instrument to get at the qualities admired or deplored in the professors with whom the graduate work was done. The two sets of replies substantiate each other completely. In both cases, the positive list is headed by "scholarliness" and such related traits as "good honest teaching," "good organization, well planned work," "enthusiasm for their fields," "high standards," or "stress on accuracy" and "objectivity." The second group of traits selected for commendation had to do with attitudes toward students: "friendliness, consideration, courtesy" or "interest in students and student problems," "willingness to let students work independently," "patience, understanding of student limitations," and the like. The negative lists carried the obverse traits but, with respect to lack of scholarship, considerable emphasis on accompanying personal

attributes. Thus such items as "feeling of importance, opinionated," "arrogance," "poor personal qualities," and the like were given as much attention as "narrow viewpoints and mincing meticulousness," for instance, or "poor preparation," "poor organization of material," "laziness," and "preoccupation with own narrow intellectual problems." The second major emphasis on the negative side, as already suggested, had to do with human relationships: "lack of interest in students," "aloofness and frigidity," "sarcasm," and the like.

The subject or procedures for the degree came in for considerable attention. With respect to required courses, 39 of the 50 reported theirs to have been fair and satisfactory for such reasons as the following: "I had ample time and opportunity to choose problems related to my major interests," "my work was set up as a logical whole," or "I knew what I wanted to do, so charted the work and completed it." On the other hand, 11 of these individuals said their courses had been unsatisfactory because of "too much stress upon form and too little upon substance," "some courses were completely useless," "petty detail soon forgotten," or "there were smatterings of too many subjects in too many unrelated fields." The differences of opinion here presented may well reflect actual differences in experience; it is to be noted that both sets of comments proceed from much the same basic viewpoint.

In answer to a question on whether they had been excused from courses later discovered to have been needed, 40 answered no but 10 in the affirmative. With respect to required courses not needed during the graduate study and not needed since, 37 reported no such experience but 12 said they had been asked to take work of this sort. Considering the caliber and professional interests of this group of college teachers, such a degree of dissatisfaction is to say the least disturbing.

All but two of the individuals responding to the questionnaire had had teaching experience before receiving their degrees. The amount of time so spent varied from two years (reported by five persons) to as many as twenty-one years. The testimony as to the value of this experience for graduate work was uniformly

favorable: "gave significance and meaning to all courses," "learned teaching techniques," gave "insight into the capacities of students" or a "practical background," and "made certain the desire to be in educational work," and the like. Most of this teaching had been done in regular positions although nearly all of the 17 who reported working in universities, did so while earning their degrees. Of the total number, 38 said they had never had "skillfully supervised practice teaching" while 11 reported that they had.

When asked about the courses in education (if any) they had had, two recorded as many as 80 units and another two 60 units each. At the other extreme six said they had none, two of them adding, "and do not want any." The replies to this question were varied and often charged with emotion. A few were bitterly critical of such education courses as they had had, some merely not interested, and others keenly appreciative of the opportunities thus afforded them. A few quotations may be in order:

All my education courses had the following values: (a) historical background and knowledge, (b) lasting interest and incentive for continual study, (c) helped me develop *my own* philosophy and psychology of education, (d) helped me to evaluate teachers and teaching, and (e) certain fundamental principles which remain.

Educational research was well organized. Two professors met the group for two years. One was constructive; he saw the possibilities. The other tended to be destructive; he saw the shortcomings; he prodded and probed. The combination made the most effective teaching I experienced.

As an undergraduate I took some 12 units (a kind of minor, I believe) in education. I very strongly felt that the men who taught these courses were dull and downright ignorant almost beyond belief. The emptiness of content and the lifelessness of the presentation created a prejudice against courses in education which was shared by students and faculty alike and which discouraged me from taking further work in the field. It has taken me fifteen years to overcome this prejudice.

Teaching in many education courses was very bad: dry lectures, uncontrolled and often away-from-the-point discussions, the personal

opinion being emphasized rather than concrete evidence (hard to get away from, I suppose, in education).

The final group of questions had to do with analyzing the reasons for the professional success and competence assumed for each respondent. First, these college teachers were asked to state the factors in their total experience to which they attributed their ability to do their work well. The answers covered a wide field including such interesting statements as "rise from the ranks of common labor," "travel abroad," "hard knocks at an early age," "practical experience in the business world." Numerically the most important items were as follows: "wide reading and mastery of the fields of learning" (21), "inspiration from great university teachers" (15), "self-study and self-direction" (15), "training in the organization of material" (13), "experience in teaching on the subcollegiate level" (12), "love of and interest in people" (12), and a "sense of fairness and appreciation of the other man's point of view" (10).

The respondents were asked, in conclusion, to evaluate themselves by a list of teaching skills on the basis of their "total university training" when the degree was granted. According to the composite score, the individuals concerned rated themselves "high" in command of lecture procedures and seminars; "fair" with respect to leading discussions, testing, and the handling of grades and grade records; and "low" in command of forum techniques. They rated their reading for graduate study and their course work as very useful in their present teaching, while their seminars and thesis studies were considered to be only a good average in this respect. As many as 44 out of the 50 said that the research methods they had been taught were definitely suitable for their own university work, while 36 considered them appropriate for their better students, and 19 even for their poorer students.

In summary, the group indicated the qualities and abilities they thought had been gained or enhanced by their doctoral studies. They rated themselves as "good to excellent" with respect to command of a teaching field, ability to make scholarly notes and records, study habits, scholarly and scientific interests

in the community, and command of teaching procedures at either the university or college level. They considered themselves "average to good" with respect to a scholarly interest in fields not very closely related to their own, their personal interest in people, ability to direct their own students' reading, intelligent knowledge of the wide fields currently of imperative importance, their understanding of present-day leaders and movements, their understanding of modern developments in education, and knowledge of the interests and abilities of their present students. On the other hand, they rated themselves as "average to poor" with respect to interest in local political affairs, religious and social developments, and the economic and industrial problems of the community. These educators considered themselves definitely "poor" with respect to only one item on the list: their command of fields closely related to their own.

In appraising these self-analyses it is well to remember that the group studied is well above the average graduate student in scholastic ability and attainment. These established college teachers have made clear in all their answers their genuine admiration for the values of intellectual grasp and discipline. If there are any differences among them with respect to the criteria used in expressing their views, these are not immediately apparent from their answers. It will be remembered with interest that the greatest agreement among them was expressed on the value of actual teaching before studying for the degree, and on the educational significance of practical experience of any kind in the early stages of professional development. The greatest disagreement, on the other hand, was revealed in their appraisals of formal courses in education. That there is fairly consistently throughout a very dissatisfied minority—roughly a fifth of the total number (not unlike the situation discovered in the eastern state)—gives reason for serious pause.

SOME GRADUATES OF A SINGLE UNIVERSITY

The third study to be reported in this chapter is a more elaborate and ambitious piece of work. It was part of a fairly ex-

tensive follow-up study of former students in a university associated with the Commission's cooperative study of teacher education. It was made under a subvention from the Commission. The section of interest here has to do with the questionnaire replies secured from the 199 Ph.D. graduates of the university who were actively teaching in collegiate institutions in 1940-41, the time of the study. In addition to the questionnaire responses, many of the individuals were interviewed personally. As in the two inquiries already discussed, the questionnaire returns included very outspoken comments.

The chief values received

At the outset respondents were asked to indicate the "chief returns realized" from their investment in the university's training. More than half checked the following: "increased professional skill" (78 percent), "increased personal growth" (70 percent), "enriched philosophy of life" (55 percent), and "a better position" (53 percent). Relatively few pointed to a "salary increase for the same work" (24 percent) or "improved socio-civic attitudes" (22 percent). This approach was continued by asking for an evaluation on a three-point scale of most aspects of the graduate program. A composite score was obtained by weighting the answers under "much" with 5, under "some" with 3, and "little" with 1, and dividing the resulting sum by the total number answering in each case.³

Interestingly enough, the highest point value secured by any item in this or other parts of the questionnaire was awarded to "research for the doctoral dissertation" (4.7—a perfect score would have been 5.) At the other extreme, and relatively seldom matched by other items on the instrument, was "foreign languages to satisfy degree requirements" (2.6). In addition, a high score (4.0 or better) was given to personal conferences with faculty members, work done according to the "independent study plan" at the university, work for the master's dissertation, and classroom lectures and discussions. "Some" value was

³ The same procedure was applied for this discussion to the raw evaluation scores provided in the study presented in the preceding section of this chapter.

thought to have been derived, on the whole, from required background courses (3.6.) and conferences with other students (3.4).

Many took advantage of the space provided to add explanations or qualifications of their check marks. These were often highly critical or very appreciative, and most were as discerning as they were frank. A few selections will illustrate the varied opinions on chief values received from graduate work at this university. The field of specialization and year of receiving the degree are supplied with each statement:

The faculty needs more time to discuss Ph.D. research and study with students. The men in charge of my work were too busy with administrative duties and teaching duties to give sufficient consideration to student work. [*Business, 1939*]

I wished to write on a thesis topic . . . in which the department was not interested. It wished me to write on a topic in which I was not interested. We compromised on a subject in which neither was interested. Largely a year unnecessarily wasted. [*English, 1931*]

I sometimes got the impression that their trips away, speaking, surveying, etc., were of more importance to the faculty than their regular classes and students! [*Ph.D. in education, 1931*]

I came to know several faculty members out of my field of specialization and these persons have contributed a great deal to my present philosophy of life. [*Chemistry, 1933*]

We were taught to be skeptical of life in general; the wisdom of this may be doubted. [*Sociology, 1940*]

Now psychology has shrunk to reasonable proportions in my world view. I believe that too much emphasis is placed on research; more should be placed on teaching. [*Psychology, 1934*]

The department could have helped me by giving more attention to the application of subject matter, more attention to student need in comparison with the departmental research program, and more concern over the student's opportunities to use his training in finding employment on graduation. [*Biology, 1931*]

The chief value of graduate work to me was absence of formal classroom work—freedom to attend seminars and consult with faculty. [*Political science, 1932*]

Significantly enough in view of some of the above comments,

relatively few of the individuals answering the questionnaire found much to check or write in on the subject of how faculty members of their major department had contributed to their training. Barely a fifth of the total number checked the subsection on advice received from these individuals. The highest point scores (3.8 in each case) were awarded by some 62 percent of the respondents to the opportunities provided to practice "organizing and presenting reports to class" and the assistance received in "securing a position."

Personal and professional development

Similarly meager interest was expressed in the section dealing with the contribution of the university experience to the respondents' general education, barely half the group feeling qualified to answer. The highest point score on "value received" was given to the social sciences (4.2) and the lowest to the fine arts (2.7), with languages and literature (3.8), and science and mathematics (3.6.) in the middle position. A considerably larger number (74 to 86 percent) had something to say on the general skills and personal abilities they had gained as a result of their stay at the university. The composite score indicates that "much" was done to educate their critical thinking (4.3) and ability to do original work (4.1). Not much more than average help had, however, been received on the score of developing discrimination, study techniques, capacity for continuous adjustment, cooperativeness, and a philosophy of life or refinement of ideals. A selection of running commentary will again be of interest:

Most of my valuable information was obtained through independent study and faculty conferences. [*Chemistry, 1939*]

My work at the university was too restricted to my major and minor fields. My preparation should have been along broader lines if I was to perform the duties I have performed. [*Chemistry, 1933*]

Suggest: study and training in world affairs; awakened interest in local community problems. The university was too much isolated from the rest of the world and normal-life problems when I was there. [*English, 1940*]

An examination requiring the candidate to demonstrate a broad background in arts and sciences might be substituted for foreign-language requirements. [*Business, 1939*]

There should be more thorough training in English composition with careful attention to grammar and style; more training in languages—ancient and modern; more training in formal mathematics; less emphasis on social sciences; substitution of thorough courses in specific subjects for all general or survey courses; reduction of required work in professional education. [*Classics, 1935*]

The nature of oral examinations in the English department should be widened to include more thought questions rather than purely factual material. [*English, 1938*]

Practice teaching as directed by the school of education at this university, was rated uniformly low by the handful responding to this part of the questionnaire. The lowest point scores on the entire form were assigned to this subject. On the other hand, there was more than the usual supply of comment—some favorable to, but most critical of the opportunity of learning to teach while serving as a departmental assistant:

My practice-teaching credit was given for assisting in *Zoology I* . . . I had no supervision from the education department. I got much inspiration and help from the outstanding teachers in the academic departments . . . ; the methods and example of such men are unsurpassed by any formal program in educational training that I know. [*Biology, 1931*]

The teaching I did as assistant in German was of utmost value to me. [*Germanic languages, 1936*]

Since I was preparing for college teaching in biological sciences I should have had practice, supervision, and criticism under the best biological-science professors at the university, not the typical "the teaching of so and so" course, and not the silly observations and practice-teaching conferences which were in vogue at that time. [*Biology, 1940*]

There was no supervision whatsoever, consequently I had to find my own methods. My department let me go my own way completely and the two or three visits from the man in education, who supervised me, yielded less than nothing. [*Germanic languages, 1939*]

I taught sections in American government at the university and

found the men in political science extremely frank in guidance and sympathetic in understanding. [*Political science, 1939*]

My work as assistant in instruction may be called practice teaching. I had almost no supervision. The complete responsibility was stimulating. I approve of the "sink or swim" situation. [*English, 1935*]

My greatest adjustment on the job was I had to learn how to teach. [*Biology, 1940*]

The university should offer one practical course in teaching methods; help students to minimize waste of time and effort on "hot air" and repetitious courses in the department of education. [*Chemistry, 1939*]

The university might help by a practical course in specific cases of teachers' maladjustment to school, students, and particularly to community: a sort of candid course in "pedagogia-pathology" from case records. [*Romance languages, 1939*]

Extracurricular activities and services

The group appraisal made of the university's services for students indicates that their "needs as prospective teachers" were definitely taken care of "adequately," as far as these respondents are concerned. The library facilities, provision for recreation, and the cultural opportunities were each given a point rating of 4.6 on the composite score, while the arrangements for physical health (4.4) and the variety of courses available (4.3) received only slightly lower standing. On the subject of housing facilities (3.7), however, and the guidance offered on educational (3.7), personal (3.3), and vocational (3.0) problems, satisfaction was definitely not so marked. Comment is available especially on the latter items; its range of emphasis is reminiscent of the statements quoted in Chapter V.

In terms of living conditions, the graduate students are still the "forgotten men." There is little recognition of graduates in living quarters, social life, or school government. [*Ed.D., 1939*]

I believe social activities might be more intimately connected with teacher-training programs so that plays and concerts, for example, might be considered a regular part of the students' life, not "luxuries" or vague "cultural opportunities." [*English, 1930*]

Prospective teachers should go to the university to study and get their social life elsewhere. Progressive education may be all right for pupils, but adults should be able to undertake a little more drastic discipline in studies. [*Ph.D. in education, 1931*]

My formal and official training at the university contributed only moderately. My unofficial contacts with individual instructors . . . contributed much, serving to refine my basic characteristics and to broaden my vision and understanding. [*Biology, 1931*]

Contacts with administrators and faculty were highly impersonal. Suggestions were entirely in regard to courses, references, facts, and authorities. At that time personal development of the student was given no consideration, or the policy was decidedly laissez faire. [*Economics, 1930*]

A less isolated existence than prevailed at the university . . . might better prepare a teacher for a place in the community life he must enter. It was even hard at times to get *news* of the outside world on the campus. [*English, 1940*]

My hardest job since getting the Ph.D. degree has been learning to fit into a different community, especially a small college community where there is more emphasis on culture than on science. [*Mathematics, 1937*]

I do not think the graduate program can, without sacrifice, take into account training for activities which are often conditioned by the particular local environment and to which any intelligent, self-respecting adult should be able to adapt himself anyway. [*English, 1940*]

The differences in the above testimony obviously reflect not only variations in actual experience—some individuals were apparently more enterprising or luckier than others—but also rather marked differences in what they considered important, or proper for a graduate student to expect of the university. Comment on the prevailing situation in student guidance was more uniformly unfavorable:

There is often a lack of frankness on the part of staff members in criticism of a graduate student's work. More aid should be given those who teach in average-sized colleges. [*Romance languages, 1934*]

Arrange for a tutorial relationship term by term, in which the professor is expected to deal frankly and thoroughly with the

student in terms of his preparation for success. Many "major professors" only advise on subject matter and course work. [*Ed.D.*, 1940]

So far as my graduate work is concerned, guidance didn't exist. My graduate career developed chiefly by accident only. [*Biology*, 1934]

Personal guidance during my years at the university would have eased the strain of my work. I had to learn the hard way, by trial and error, how to prepare myself for the Ph.D. [*English*, 1930]

At the same time, as many as 73 percent of these doctoral graduates thought it characteristic of this particular campus that the faculty respected student viewpoints, and 66 percent thought they showed concern for students' problems. The university "spirit" was however given a rating of only 2.8, with 94 percent of the group responding, on the score of its contribution to the graduate training.

Summing up the entire evidence from this third study, it may be said that the 199 doctoral students who answered the questionnaire rated their graduate experience very high on the side of intellectual stimulus and discipline, but not more than average or lower with respect to cultural factors and matters of human relations. Except on the score of personal relations their experience seems to have been roughly comparable throughout, despite the wide range of specialization among them. Their differences of opinion consequently tend to reflect temperamental differences or variations in professional outlook.

BY WAY OF SUMMARY

Although the three studies here highlighted concerned different groups of students and were made with different instruments, the general intent was identical and the main trend of the results was strikingly similar. In each case most of the persons studied—and they were all established college teachers—thought distinctly well of their graduate experience, as far as intellectual values are concerned, and claimed that the work had been relevant and even helpful to their professional needs on the job. Despite the great variety of their experience—

with individual graduate schools and particular departments—their negative criticisms can be traced more often to dissatisfaction with the quality and integrity of the scholarship encountered in their professors than to basic divergences in educational philosophy.

It is particularly to be noted that most of them agreed on the value specifically of the research techniques required of them during their graduate work. In one group it was the dissertation that was ranked highest and in another it was the general reading and course work, but in every case it was some phase of the regular intellectual discipline now associated with the doctoral program. While they differed as to the appropriateness and value of broadening cultural experiences and formal personnel procedures, most of them indicated that their graduate study had not been particularly strong in these respects. The remaining point on which the great majority agreed was the educational significance of firsthand, practical experience at some stage during a college teacher's development.

Despite the pronounced majority view in each set of questionnaires, it is likewise important to stress the irreconcilable minority found in each study. The nature of the instruments may well account in large measure—but possibly not entirely—for the fact that the critics were very much better at denouncing what they didn't like than in making suggestions for improvement. The point of greatest tension within each group, attested to by the vigor and emotionalism of the statements concerned, had to do with the functions and offerings of departments of education. The heaviest criticism of all tended to come to a head over courses in education and supervised practice teaching.

VII

Toward Improving Ph.D. Programs

WHAT CLUES, if any, for improving Ph.D. programs can be discovered from the facts and opinions presented in this report respecting conditions that now govern award of the degree? Answers will vary with the frame of reference used. Any objective study of the opinions expressed in the three preceding chapters will make evident the great variety of underlying assumptions held. Moreover, such an examination will show that individual experience, purpose, predilection, and bias entered perhaps more largely than philosophical hypothesis into the determination of an individual's judgments. It is therefore to be expected that the suggestions with which this study concludes are likewise colored. The introduction attempted to put before the reader the leading conceptions for which this volume stands. Briefly, it declared the advanced graduate school is here considered to be an undifferentiated professional school that should continuously adapt its program to the social uses which prospective doctors of philosophy can make of the information and insight gained in the course of their study. It contended that the best way to improve the preparation of college teachers or any other occupational group, during the period of graduate work, lies in introducing procedures calculated to strengthen the graduate school's capacity to operate as an integrated whole rather than as a congeries of more or less autonomous departments and divisions.

On the basis of these guiding concepts, proposals will be made for providing a large and integrated core of common fundamental study for all candidates in a major field such as English,

chemistry, education, or economics. Suggestions will also be made for differentiating programs to provide specialized knowledge and relate it and fundamental learning to the needs of specific occupational groups. It will be recalled that data on a decade of doctoral graduates showed the following occupational distribution: 65 percent college professors, 20 percent workers in industrial research, 10 percent government administrators, and 5 percent in precollegiate education. Under this conception it is believed that provision can be made to meet the scholarly needs of Ph.D. recipients, say in economics, employed in the four diverse occupational groups without reducing doctoral study to the trade and technical level, or without subscribing to the dubious theory that doctoral learning is universal in application.

These proposals for change in the nature and scope of doctoral work will be accompanied by suggestions for modifying certain time-honored administrative and instructional procedures. While it cannot be explicitly stated following each proposal, it is of course recognized that the feasibility of adopting an idea in a given institution is determined in part by finances, by the stage of development of its graduate program, by its administrative organization, by the size and quality of its faculty and student body, and by local factors seldom known to outsiders. Comments will be arranged under four main headings: orientation and scope of doctoral work, organization of the graduate school, the program of studies, and student personnel administration.

ORIENTATION AND SCOPE OF DOCTORAL WORK

Most of our graduate schools grew up rather opportunistic-ally. This section suggests two steps toward a considered plan for promoting purposive and orderly growth. The first has to do with articulating doctoral programs with previous undergraduate and graduate work, and the second suggests factors that should be considered in deciding on the number and nature of doctoral programs that an individual school may wisely offer.

The commonly used designation "graduate school of arts and sciences" is an historical symbol of that division's origin in the American undergraduate college of liberal arts. This relationship, described in considerable detail in Chapter I, is still a dominant influence and goes far to account for the lack of articulation between programs for the Ph.D. degree in the arts tradition and preceding work that has departed from it. In the good old days an A.B. degree qualified one to matriculate for an A.M. degree that was a way station on the road to the doctorate which prepared for competence in research. But since around 1875 American industrial, commercial, and agricultural development has called for a practical type of undergraduate work with its own terminal objectives. Our colleges symbolized these programs with half a hundred differently designated bachelor's degrees and for the time being left the A.B. degree relatively untouched. By 1915 many individuals who had pursued the new undergraduate studies were offered the opportunity of taking graduate work of the same nature leading to the degree of M.S. By the end of another ten years departmentally designated master's degrees of a semiprofessional nature were being awarded in agriculture, business administration, engineering, education, home economics, and a number of other fields. The arrangements permitted functional latitude to the departments concerned and at the same time protected the "integrity" of the traditional A.M. degree.

Inevitably the diversification of programs leading to the preliminary degrees in due time influenced the situation at the higher graduate level. Demands for further training arose from those who had been prepared in the newer and more vocational fields. Since around 1925 graduate schools have increasingly responded by permitting such persons to become candidates for the doctorate, but with little or no modification of the established requirements for its award. Such requirements have, in the nature of the case, often been quite out of line with the prior experience of these matriculants and, as far as they could see, not particularly related to their needs. The result has been a situation perplexing and irritating not only to

many graduate students but also to graduate faculties and—at a later point of time—to employers of persons on whom the Ph.D. has been conferred. To add to the mounting confusion, changes have been made during the last two decades in liberal arts programs for both the bachelor's and master's degrees which have resulted in less articulation between these degrees, and between them and the traditional requirements for the doctorate.

What steps are likely to promote the integration which everybody agrees is now called for between most doctoral programs and the work that has preceded them? The dean of a leading graduate school says that, in his considered judgment, the remedy lies in returning to "authentic" programs in arts and science as a prerequisite for matriculation for the Ph.D. degree. It is also his opinion that "we should stand firmly on the principle that the graduate school will not indulge in professional and adult education outside its proper sphere. If fifth- and sixth-year programs are needed, let the university provide them outside the graduate school." Aside from the fact that such action would require someone to wave a magic wand and undo three decades of educational history, it would take many graduate schools out of the main current of advanced scholarly work and reduce them to a numerically insignificant role in the university.

My own suggestions for securing better coordination will be appraised by some as going to the opposite extreme. I should like to see social usefulness lay down the requirements for each level—bachelor's, master's, or doctor's—of training, and to do this in the main without reference to candidacy for the next higher degree. By requirements I do not mean mere static hurdles to be cleared before receiving the degree. Rather, such requirements should be defined in terms of the knowledge, skills, attitudes, and other powers which enter into the development of specified competence to which the particular college or university program is geared. Since each degree may be terminal in nature one should not expect the first two to add up to matriculation for the Ph.D. automatically. Such an occurrence

is to be anticipated only when an integrated program has been planned which from the beginning is aimed at securing the doctorate.

There would, accordingly, not be a single pattern of competence and hence uniform subject matter for the degree at each of the three academic levels, such as the dean just quoted would probably consider ideal. Instead there would be a number of identifiable patterns at each level with the educational content determined in each instance by the relevant social and occupational needs. The several patterns would have a large core of experience in common but would also be differentiated according to the demands of particular vocations. In my judgment, the degree symbol used should be kept simple (no more than A.B., B.S., A.M., M.S., and Ph.D. are needed) and should not be expected in itself to reveal the nature of the work done to earn the degree. Only a certificate or transcript can really show, for example, whether or not the holder of a given degree has the mathematical competence required for professional activity as an actuary, a secondary school teacher, or a mathematician in industrial research.

According to this conception all requirements for the degree are shaped by the vocational goals the individual is pursuing at the time. Thus a person who has successfully completed a particular program leading to a bachelor's or master's degree, could not expect to be matriculated for advanced work of a different type without being required to take additional undergraduate or master's courses that are basic to his new purposes. Even if he proposed to continue in his original field he might reasonably be held subject to such special requirements if his earlier programs had been planned as terminal rather than as preparatory to advanced work. No degree in itself, in other words, should be considered as sufficient for admission to the next level of training. This should be true, furthermore, regardless of whether the degree has been awarded by some unapproved college or by an institution approved by the Association of American Universities. Conversely, if the individual has the competence needed for entrance to a program of study

he should be admitted whether he has a degree or not. But as I see the principle being applied, more individuals with a bachelor's or master's degree who seek to enter advanced programs will be required to do additional qualifying work than will be admitted without a degree.

Another major aspect of over-all planning that each graduate school should do for itself is determining the number and nature of doctoral programs (if any) it may profitably offer. Only 96 of the approximately 600 institutions in the United States which give graduate work of any kind confer the Ph.D. degree. Indeed, some of these might have been wiser not to do so; first-rate graduate work makes heavy demands on budget, staff, and physical facilities. Reference to Table V on pages 60-62 shows great variation in the number of departments offering the degree in the 94 institutions that furnished data for this study. The range was from one to forty-one departments, and limited resources restricted the types of program undertaken in practically all of them.

It undoubtedly will be disappointing to a graduate faculty that is interested in evaluating its resources for doctoral work to learn that leaders in the field have not yet developed an instrument for this purpose. We do not have a comprehensive statement of quantitative and qualitative criteria—comparable to those used for appraising and accrediting undergraduate colleges—by which a graduate faculty may make an inventory of its over-all and departmental resources for giving doctoral programs. A first step in the development of such an instrument was taken in 1933-34 when Robert M. Hughes, then president of Iowa State College at Ames, through a committee of the American Council on Education published a list of departments in graduate schools that were considered especially competent to undertake doctoral work.¹ Placement on this list was made by the vote of a national jury of outstanding men in each field rated. There has been a recurring demand in graduate school circles for a more comprehensive and more objective

¹ See Robert M. Hughes, "Report of the Committee on Graduate Instruction," *The Educational Record*, XV (April 1934), 192-234.

instrument for appraisal, but this has not yet been satisfied.

Since its 1942 meeting the Association of American Universities has been conducting confidential jury-type polls, by and for its members, of the comparative resources for doctoral work of member institutions. In time this may lead to a statement that will have wider usefulness. A news note in *School and Society* for December 2, 1944 indicates that the Conference of Graduate Deans of the Southern States has taken a further step along these lines. It has appointed a committee to prepare a set of criteria for experimental use. I should like to see a comprehensive quantitative and qualitative statement for this purpose developed cooperatively by all of the regional and national associations with graduate school membership. I envision a statement comparable to that now used by the North Central Association of Colleges and Secondary Schools for accrediting undergraduate colleges. But, in my judgment, at the doctoral level such an instrument should be used to determine eligibility for membership in voluntary organizations rather than for the purpose of formal accrediting.

In the absence of any generally accepted statement of criteria by which to judge readiness for doctoral instruction, university officials arrive at the relevant decisions by their own subjective judgment. Leaders in those departments that first give the Ph.D. degree often become the judges of the fitness of other departments that express a desire to offer similar work. Usually, as was shown in Chapter I, these departments are those of the humanistic liberal arts with a sprinkling of the older natural sciences. The ideas of their leaders as to the desirable nature and proper scope of programs for the doctorate in philosophy often differ markedly from those held by representatives of the newer fields. These fundamental differences in viewpoint make for the open professional warfare, armed neutrality, and guerilla tactics which frequently characterize graduate school behavior at the present time.

The natural sciences provide an example of the long-range outcome of these clashes. They now have an assured place among the fields considered suitable for doctoral study, but

such was not the case in the last two decades of the nineteenth century when President Eliot and his supporters throughout the nation were fighting to gain recognition for them in undergraduate as well as in graduate curricula. It is interesting to note that almost the identical arguments used against the suitability of the sciences for doctoral work are today used against the still newer fields. Almost every graduate faculty in the nation has an able and articulate contingent who follow the lead of Abraham Flexner² and Norman Foerster³ in declaring that the Ph.D. degree should not be given for work in home economics, library science, physical education, speech, and a score of other fields that are semiprofessional or even more narrowly vocational in nature. Despite this opposition to pouring new wine in old skins, the data presented in Chapters II and III indicate that nearly one-fourth of the Ph.D. degrees earned during the 1930's were awarded in fields other than the traditional arts and sciences.

When the needs of American life for scholarly personnel are reinforced by the zeal of leaders in a new graduate field there is usually enough strength to force the issue. The field in question is admitted to the family of graduate departments authorized to give the Ph.D. degree, but the leaders from older fields usually are not happy about the decision. The customary response is to impose the letter of traditional requirements for the doctorate on the new department. I suggest that an intellectually and educationally sounder procedure would be to increase the flexibility of requirements to meet the indisputable needs of the field newly admitted to doctoral privileges in the university. It seems to me inappropriate, for example, to apply identical criteria to research in chemistry and in the fine arts or to expect the field of physical education to use tools of research suitable in mathematics or philosophy.

No one questions the right of the graduate faculty of any university to determine for itself the fields in which it will offer

² See Abraham Flexner, *Universities: American, English, German* (New York: Oxford University Press, 1930).

³ See Norman Foerster, *The American State University; Its Relation to Democracy* (Chapel Hill: University of North Carolina Press, 1937).

work for the doctorate, but I do suggest that this be done by normative standards that are generally accepted by the faculty. Certainly any definition of the proper scope and range of doctoral study should be kept broad and flexible enough to permit new fields to develop in accord with their own nature and with social demands. Degree requirements should never be allowed to become a Procrustean bed on which the functional usefulness of a particular program may be distorted or destroyed. The best known instance of a fight against such tendencies has been waged by schools and departments of education. Nor is it perhaps an overstatement to speak of the resulting internecine strife as the great schism in the history of American graduate schools. As was shown in Chapter I, Daniel Coit Gilman and G. Stanley Hall clearly felt no animosity against the field of education when they started doctoral work in it at Johns Hopkins University. Distortions came to the fore only when research in this branch of applied social science was made to conform to the standards developed by and for the humanities and the natural sciences.

In a number of universities, schools of education have set up the Ed.D. degree as a means of avoiding the too literal application of essentially alien standards. This is of course not to deny that other schools of education turned to this new degree because their leaders believed education to be as distinct a professional field as medicine or law. But the individuals concerned now generally admit that the training of most of their candidates is weakened when not buttressed by substantial graduate work in the arts and sciences. It is because of this realization, along with their recognition of the prestige of the older degree, that so many of them have fought for the right to give a functional Ph.D. in education.

How an individual university resolves the issues implicit in awarding either or both the Ed.D. and the Ph.D. in education is likely to be determined more by its own history and current situation than by abstract considerations of what it is best to do. In graduate schools where leaders of the older arts and sciences are in control and where there is a long tradition of "pure research," it is likely that the Ph.D. will be reserved

for those who show research competence and that other doctoral degrees will be found to symbolize teaching and related competence. President Robert M. Hutchins of the University of Chicago recently emphasized the often stated opposite viewpoint, to the effect that the Ph.D. should be returned to its historical role as a characteristically professional degree and that new designations should be found for the doctorate in research. A quick look at practice shows that Harvard University grants only the Ed.D. in education and that independent of the graduate school. Teachers College, Columbia University, gives the two doctoral degrees and the student may, after advice, take his choice. At Northwestern University the graduate school administers both degrees, awarding the Ed.D. in all fields when the candidate looks to teaching as a career and the Ph.D. when he qualifies for a career in research. The Massachusetts Institute of Technology follows the implications of the Hutchins suggestion by awarding the Sc.D. as an earned research degree in science.

If the creation of additional doctor's degrees represents the most feasible way of getting conditions that allow for genuine adaptation to occupational and social needs, then let them increase! However, experience with a long list of different and fairly fixed patterns of master's degrees (at the latest count one university offered seventeen in engineering alone) suggests that more flexibility for each individual is usually provided by using one degree for all students at a given level. It is not likely that we shall ever have enough individually designated doctorates to show the true scope of the various programs pursued. Even if we had a degree of doctor of chemistry, for instance, that would not tell the prospective employer whether the candidate were best qualified to be a chemical engineer, a food chemist, a teacher in high school or undergraduate college, or a graduate school professor.

ORGANIZATION OF THE GRADUATE SCHOOL

The issues just discussed, having to do with the proper scope and articulation of doctoral programs, for all their fundamental character are no more than symptoms of deeper dislocation in

the working organization of graduate schools. The really basic question is whether or not the graduate school can and will operate as an organic unit or whether it will continue to function as a loose federation of almost autonomous departments whose subdivisions sometimes act with a freedom approaching academic anarchy. This is not a matter that can be resolved merely by tinkering with the mechanics of administration. Nor do I wish to imply that centralization in itself holds the key to the situation. Undergraduate colleges with centralized administration have produced as many academic dictators as the autonomous-department scheme, nor is their record any better on the score of promoting what Immanuel Kant long ago called the "capacity to see things steadily and see them whole."

This section will therefore be concerned with certain administrative and organizational devices that may be used to further purposeful working together on a graduate faculty to the end that doctoral candidates may be prepared to the fullest possible extent for all major duties of the careers at which they are aiming. Even casual study of Table I (pages 40-41), dealing with the number and distribution of Ph.D. degrees conferred in the decade, suggests the futility of proposing specific plans for institutions that vary in size and complexity as much as do, for example, Columbia University, Rice Institute, and Duquesne University. Precisely what constitutes a feasible arrangement for reducing academic individualism is better left to those who know the intricacies of a particular situation. They are more likely than outsiders to know how and where the most promising attacks can be made. Moreover, genuine progress toward unified group action is peculiarly dependent on self-initiated projects at the grass roots.

A brief glance at the administrative setup of several universities, as they contrast with the structure prevalent among institutions of arts and sciences at both graduate and undergraduate levels, will illustrate the diversity of locally sound approaches to the problem here under discussion. At the University of Chicago work for the upper two undergraduate years and for graduate study is organized by departments

which in turn are grouped into major divisions that have their own deans. This arrangement reduces departmental autonomy and promotes integration within a division, that of the physical sciences for example, but leaves something to be desired in the way of over-all coordination. At Columbia University, on the other hand, the undergraduate and graduate colleges have what for all practical purposes amounts to separate and budgetarily independent faculties. In other words, the graduate faculties there have roughly the status of the Johns Hopkins faculty before the undergraduate college was added to that university. At Princeton University the graduate faculty is not only structurally independent but operates under a budget controlled by the graduate school.

At Ohio State University the departments are responsible for both graduate and undergraduate work but the undue predominance of any one is checked by a strikingly unconventional university structure. The principle followed is that "each of the colleges with central professional and occupational function shall have included in its organization the subject-matter departments regarded as basic" to its purposes, these departments also being expected, however, to serve the needs of the entire campus. Thus the departments of economics, sociology, and geography are in the College of Commerce; botany and zoology are in the College of Agriculture; psychology, fine arts, and music are in the College of Education. The graduate dean is a director of advanced studies rather than an administrative officer. This setup tends to foster interaction and heightens the cooperative "relationships that necessarily arise from interdependence."⁴

Atomism or extreme specialization and organizational subdivision is of course not an ill peculiar to graduate schools. It is highly characteristic of most of contemporary existence. The fact that the problem is widespread, however, in no way lessens—on the contrary, it increases—the responsibility of each institution to work out the best solution it can. Furthermore, the

⁴ Arthur J. Klein, ed., *Adventures in the Reconstruction of Education* (Columbus: Ohio State University, College of Education, 1941) pp. 14-15.

difficulty has particularly strong roots in campus folkways. It is not unusual to find a graduate faculty of seventy-five members divided into twenty or more nearly independent departments. One university reported the field of biology split up among no less than fourteen departments or subdepartments. The average professor, both by training and by vested interest, has learned to be suspicious of enterprises that ignore or blur departmental or divisional lines. Even within his narrow niche, academic folkways put a premium on "lone wolf" tactics which go by the more respectable names of independent or original research. In the larger American culture beyond the campus strong countertrends to this form of individualism have been gathering momentum at least since the turn of the century. Increasing emphasis is coming to be placed on cooperation and synthesis. If the professor were employed by the Tennessee Valley Authority or the Bell Telephone Laboratories, for example, his special knowledge would be part of a group effort in socially useful undertakings. The academic world tends to lag more than a little with respect to cultural change.⁵

I submit that the doctoral training of a good teacher or research worker should likewise be a group project; it transcends departmental lines to a greater extent than is commonly recognized in graduate practice. But until we can modify the pattern of things that condition academic life there is little reason to expect that graduate schools can adequately meet the demands expressed in the three preceding chapters by college appointing officers, nonacademic employers, and the doctoral graduates themselves. It will be recalled that these persons were largely of one mind when they asked for more breadth and integration in the presentation of fundamental knowledge, and for more emphasis on the development of

⁵ For a discussion of the cultural situation here touched upon see The Commission on Teacher Education, *Teachers for Our Times* (Washington: American Council on Education, 1944), "National Problems and the Demands They Make Upon Us" in Chapter II, pp. 40-75; also W. Earl Armstrong, Ernest V. Hollis, and Helen E. Davis, *The College and Teacher Education* (Washington: American Council on Education, 1944), "The Modern Drive Toward Integration" in Chapter VIII, pp. 257-66.

human qualities essential to working effectively with others. Indifference and neglect in these two areas have indeed gone so far that the resulting isolation is beginning to generate its own corrective. For in a growing number of fields, research cannot be effectively advanced nor its findings fully understood until they are examined in the larger perspective of data from other fields. This can seldom be accomplished without cooperative exchange and joint effort. Moreover, individual professors here and there in graduate schools over the country are having a salutary influence through eye-opening contacts with local institutions where their recent doctoral students are employed.

The gist of the matter is that significant changes in the structure or function of a graduate school will not be made unless some means are found to increase the group consciousness and social vision of a working majority of its staff. The necessary spirit can hardly be promoted unless the faculty has the opportunity to work together on the school's important problems and to be concerned with matters of more than departmental scope. Because they are in a position to see the program as a whole, graduate deans are often more eager than the rank and file of their colleagues for new methods and administrative arrangements. Experience has revealed that many procedures, originally introduced with other immediate ends in mind, can serve to bring graduate professors closer together in something like organic partnership. Among these two can be heartily recommended, especially if they are carried out concurrently. First, a study of the backgrounds, aptitudes, and interests of a representative number and sample of graduate students; and second, a thoroughgoing examination of field practice in the major occupations to which doctoral graduates go after receiving their degrees.

The suggestion of using these two types of study together is not intended to imply that all professors need to do is investigate the situation and then adapt their programs and procedures uncritically to their findings. They will still need to resolve the issue between what *is* and what *ought to be*. But it is in the

joint attack on problems of this kind that I see the great opportunity for developing that mind-set and predisposition toward constructive change that appears to be so much needed. To be sure, no graduate dean who leads his faculty in such a project should be surprised if the procedure confirms a few individuals in convictions he hoped the experience would modify. But for most of his staff a year spent in the committee type of study, based on factual evidence and if possible firsthand observation in the two large areas suggested, will exert a powerful and salutary influence. These individuals are practically certain to widen their perspective for dealing with such problems as the selection and admission of graduate students, matriculation for candidacy to the degree, determining the program of studies and gauging progress in it, awarding financial assistance, and assisting with the placement of graduates.

THE PROGRAM OF STUDIES

It has just been suggested that significant structural or functional modifications in programs of graduate study are in large measure dependent on the faculty's readiness for change. Since the average university situation does not normally provide many opportunities for developing the required insight in members of the staff, the primary task of those responsible for leadership is to devise projects which will impel graduate professors to study their roles as educators. Getting men who customarily specialize in producing and disseminating research in their own restricted fields to work as earnestly on instructional problems is admittedly a tough and time-consuming undertaking. The degree of success of such a venture is, however, determined primarily by the vision, ingenuity, and persistence of the group and its leader.

In order to avoid head-on collisions with the deepest convictions and vested interests of a faculty, it may be well to start the process with a consideration of master's rather than doctor's degree programs. Harvard University found such an approach fruitful in the field of English and Ohio State University used it successfully in the social sciences. Of eight staff members who

supplied leadership for the Harvard project, three were from the field of English, two each from education and from the social sciences, and one from the committee on admissions. The item in their experience that is important to our purposes is that they decided to inform themselves and other faculty members about student needs; about the responsibilities of the teachers they would train, as these are influenced by school organization and the nature of secondary school curriculum; and about promising current practices for the education of teachers that might be found in other liberal arts colleges and universities. In its report the committee regrets "a certain remoteness" of the general graduate faculty from these problems and recommends that the relevant members of all departments should "deliberately reorient and re-educate themselves, not only with reference to the past training of undergraduates who come to them, but also with reference to the training of those who are going out to create future undergraduates."⁶

The graduate faculties in the social sciences of the five publicly supported state universities of Ohio were brought naturally into a situation which accelerated their readiness for program change.⁷ They decided to join with professors of education and public school administrators in developing a program for the master's degree that would be more nearly in keeping with the "needs and demands of the public schools." This enterprise was launched with an extended conference attended by forty-one representatives from the universities and eleven from the public schools. The former delegation included five graduate deans, seven deans and professors of education, three supervisors of social studies, and twenty-six specialists in economics, geography, government, history, political science, and sociology. Although we are not here concerned with the findings of the conference, it is important to note, for the purpose of illustrating how specific faculty groups have increased their insight, that the process did

⁶ See *The Training of Secondary School Teachers, Especially with Reference to English*, report of a joint committee of the faculty of Harvard College and of the Graduate School of Education (Cambridge: Harvard University Press, 1942), pp. 122-23.

⁷ See Armstrong, Hollis, and Davis, *op. cit.*, pp. 214-22.

not end with the conference. On returning to home base each group drew into its deliberations practically the whole of the graduate faculty concerned with the master's degree program in the social sciences.

At Ohio State University, to follow through on developments at one of the five Ohio institutions, the social scientists and educationists who had attended the statewide conference requested the graduate dean to appoint a committee of eight persons whose mandate should be to study the "actual educational needs" of Ohio social studies teachers, and the "policies and practices of other graduate schools" with respect to comprehensive majors and other essential elements of their programs. This committee was also asked to recommend to the graduate council, after consultation with the staffs concerned, "an appropriate program" including the necessary administrative arrangements. Investigation and deliberation required a year of intermittent work and, aside from the immediate usefulness of the recommendations made, it is the judgment of officials at Ohio State University that the experience has favorably influenced behavior in planning and administering doctoral programs.

Suggested emphases in graduate work

Some leaders in graduate education distrust the general approach here described on the ground that it may lead staff members to lose sight of the high intellectual goals which the Ph.D. degree is supposed to symbolize in American cultural life. Moreover, such persons are convinced that activities of this sort predispose a faculty to admit hordes of plodding students who are only interested and capable of succeeding in practical programs, more narrowly vocational in nature even than those already offered by graduate professional schools on the campus. For the benefit of educators with such anxieties it should be pointed out that the dreaded outcomes are not necessarily inherent in a careful examination of what employers and students alike consider to be their real needs.

Indeed, the opinion sampled in the present study points in

the opposite direction. In spite of discordant notes, a consensus was revealed to the effect that graduate schools are now producing too many narrow specialists whose education consists in little more than the technical preparation and trade skills required for immediate adjustment to a job. Most of the individuals who sent in comments implied in one way or another that research training as currently offered seldom qualified doctoral candidates for rich personal and social living within the framework of their chosen occupations. They wished that advanced graduate work might contribute more specifically to the liberation of the student's mind in at least three ways: first, by introducing him to intellectual freedom through discipline in logical methods of thought; second, by enlarging the scope of his ideas through relating his rapidly expanding acquaintance with a specialized field to the great expanse of related human knowledge; and third, by extending his freedom in the social sphere through increasing his ability to communicate ideas to others. In other words, their plea was for the type of specialist that Nicholas Murray Butler once characterized as a "broad man sharpened to a point."

Most graduate school officials do not object to this ideal for advanced education but they do differ from employing officers on how it may best be promoted and on what part of it should be attempted in the limited time allotted to graduate study. It will be recalled that some who were engaged in doctoral instruction repudiated any responsibility for the personal and social development of their students; others said the employers' bill of particulars expected graduate schools to provide liberal education that should have been attended to in the undergraduate years; and still others objected to assuming any obligation for preparing candidates to communicate ideas to others, the inference being that ability to acquire and possess ideas would assure their effective oral or written communication when an occasion demanded it.

In the judgment of many of those who contributed opinions, graduate school faculties tend to rely too largely on abstract intellectual measures for reaching the goals they do envision.

Thinking at the graduate level, as at any other, has so much physiology and sociology in it that the whole person and his environment should be considered in planning and conducting a program of studies, or in appraising progress in it. In different language, that is what recent recipients of the doctorate and others were saying when they advocated better living arrangements for graduate students with families, more informal opportunities for them to come abreast of contemporary social developments, and better cultural situations in which to develop the personal qualities employers expect in doctors of philosophy. It was this causal relation between physical, emotional, and intellectual behavior that employers were emphasizing when they asked graduate schools to strengthen personnel and instructional procedures calculated to develop the whole flesh-and-blood individual.

The tendency of the graduate school to divorce subject matter from the self has not always encouraged the healthy objectivity it was designed to produce. We no longer expect the investigator, the teacher, or the statesman to be a neutral entity outside the vital forces with which he is working. Rather, we expect him to have a scheme of values out of which a frame of reference is made explicit for his own guidance and for the use of others who need to interpret or apply his findings. Therefore I suggest that every major field of study use a seminar or other means to point up the social philosophy and broader purposes that should guide creative workers in the area. In the hands of competent leaders such a seminar would justify the use of the word "philosophy" in the symbol of the degree; for example one that Professor E. G. Conklin conducted for many years at Princeton University on the history and philosophy of biology. It is the meagerness or absence of such opportunities in graduate education that led a committee of the American Sociological Society recently to deplore the lack of conviction in the teaching of sociology, and to indicate that this might be due to overemphasis on scientific "objectivity." If he is to be truly effective, a professor should not be restrained from stating his personal values and conclusions. Both college ap-

pointing officers and employers from government and industry would applaud such integrating seminars as furthering their interest in broad intellectual grasp.

Obviously no one person has the insight, information, and position of vantage to qualify him to make detailed proposals on what is basic or fundamental in a field for all doctoral candidates regardless of their occupational intentions and individual purposes. Neither is it wise to leave such decisions to even the composite judgment of a group of specialists in a field; their proposals should be checked by competent persons in supporting fields and by the testimony of those who give professional direction to the individuals employed in the major occupations which the field serves. The continuous discovery of new knowledge resulting in the proliferation of courses and seminars reduces the likelihood that any self-contained group can do such a job for itself. Accordingly, all that is feasible here is to suggest a procedure for determining the "minimum essentials" that have universal application.

First and foremost, the task of determining what program of courses and seminars should be offered to candidates of widely different occupational intention should be a group undertaking for the faculty as a whole. If all decisions were left to individual professors, many fields would be left without any differentiating courses and would offer only a single program for all comers. On the other hand, if the plans were made only by professors of education, personnel enthusiasts, and college deans then individualized courses might easily overbalance the amount of fundamental discipline provided. Perhaps to a less degree, the tendency to overemphasize differentiated courses would likewise characterize employers in government and industry when they sent their staff members back to graduate school for further training. The best balance between basic work to be required of all students and study differentiated to suit specialized needs is likely to be achieved when the thinking of the whole faculty, or at least of representatives of all related departments, is focused on the demands an occupation makes on the individual.

My belief in the soundness of this recommendation has enabled me to eliminate from this chapter several pages that set forth my own proposals for courses, seminars, and off-campus experiences which seem to be needed only by college professors, or only by government employees, or only by employees in industrial and commercial laboratories. This material would have indicated a need for both firsthand and vicarious experience on the nature and purpose of the type of organization the graduate student expects to enter, on the over-all and specialized demands it is likely to make of him, and on the conditions which determine the giving or withholding of rewards. For example, one is particularly tempted to advocate that since service on a college faculty in this country is supposed to be appraised in terms of at least six factors—teaching, research, personal qualities, standing in the profession, participation in departmental and university planning, and participation in community affairs—that these elements should appear in the candidate's program of doctoral study. Similarly, one is tempted to elaborate on the integrating and seasoning values likely to accrue from a competently directed program of apprentice or internship teaching for prospective college teachers. While those who expressed an opinion on the subject for this study were for the most part contemptuous of routine "student teaching," they favored innovations in this area such as are being conducted in certain departments at the universities of California, Colorado, Michigan, Ohio, Stanford, Wisconsin, and many other graduate institutions. In June 1944 Ohio State University reported that only 86 out of 741 doctoral candidates graduated since July 1937 had had no teaching experience when the degree was conferred, and that a majority of the 741 received such experience on the junior or senior staffs of the university.

Suggested modifications in instructional procedure

Many of those who contributed opinions to this study join with the writers of professional literature in expressing dissatisfaction with the premises graduate faculties appear to favor in approving and guiding dissertation research; with the ca-

preciousness of their demands in the use of the tools of research; and with the lack of meaning often associated with the final examination ritual. Practically all of these comments deal with *symptoms* that should disappear when the more basic reconstruction already discussed has taken place. In the meantime, some steps might be taken to improve some of the more objectionable practices.

Most candidates and employers agree with the graduate faculties in the judgment that the dissertation should continue to be the heart of doctoral training. But they assert that it is in danger of becoming meaningless through strict adherence to largely outmoded standards which require the dissertation to be a self-initiated "contribution to existing knowledge." Employers are convinced that richer and more lasting education is likely to result from a research project that focuses attention on securing command of a variety of research methods and skill in critical appraisal of the scholarly work of others. They believe that extending the boundaries of knowledge is more likely to be a later stage of growth for the individual, and that worthwhile contributions are more likely to be made effectively on a cooperative basis. Too often the dictum of "original" or "individual" restricts the candidate to some obscure author or insignificant development that nobody else has thought worthy of attention.

In any event the dissertation research is likely to be more functional if it grows out of the candidate's personal and occupational interests. No doctoral student should ever need to record a story like the one cited in Chapter VI: "I wished to write on a thesis topic in which the department was not interested. It wished me to write on a topic in which I was not interested. We compromised on a subject in which neither was interested—largely a year unnecessarily wasted." If a department does not have enough scholars to serve the variety of occupational purposes of its students, it should increase the one or decrease the other.

There is a singular lack of understanding and tolerance between departments on what constitutes an acceptable disserta-

tion. These differences in conception of the nature of "real" graduate study cause the candidate unending trouble in getting his work approved. Too often he is the innocent victim of a clash of departmental ideals that he seldom understands and certainly cannot alleviate. Perhaps the best way to soften the blistering "off the record" criticisms of one department by another, and to reduce the intransigent behavior of individuals who must agree on the acceptability of a dissertation, is to enlist them in a study of the nature and social application of the fields in question. Once something like a common mind is developed around a specific joint interest, more than a softening of carping criticism is usually achieved. It can lead to improvements of many kinds including mutual adaptations and the strengthening of staff and facilities in some of the weaker departments. The unifying process is of course more likely to be furthered if the graduate school is organized with sufficient central authority and budget to influence developments.

A final step I wish to recommend for strengthening thesis research is that of requiring authorization from more persons than just the candidate's sponsor—a practice already in use in many universities. The pooling of ideas is an effective democratic procedure for graduate professors as well as for men in other walks of life. While we may assert that professors who cannot do a first-rate job in approving research projects should not be allowed to sponsor doctoral candidates, the fact of the matter is that most schools do have and must use some professors who fail to meet this qualification fully. But regardless of individual merit on the part of the faculty, the best interests of the student are served if the sponsor is required to check his judgment with that of two or more colleagues anywhere in the graduate school who have special competence in the general area in which the proposed thesis lies. The same individuals should read the completed report critically before it is submitted to an official examining committee.

Let us now turn to the consideration of foreign languages and other tools needed for doctoral research. There is no more controversial issue in graduate practice than that of determining

what skills should be required of doctoral candidates and how competence in these shall be measured. The only point on which everybody concerned agrees is that there is at present something definitely wrong with the situation. Every professor has his personal remedies. My own are stated in the two succeeding paragraphs.

The candidate should be given at least a beginner's acquaintance with the tools of research most commonly used in the field in which he expects to work. He should be required to have more skill in the ones needed for effective work on the particular project he has chosen. It does not follow from the fact that foreign languages and cultures are an important part of man's liberal education that they should invariably be part of advanced graduate work. Immediate or common occupational use should be the criterion for establishing all requirements. In the fields usually covered by the term "humanities," foreign languages and their literatures are of the utmost importance and the well prepared candidate may matriculate with a full command of two or more languages other than his mother tongue. But this circumstance and the fact that the humanities fixed the early pattern of doctoral requirements can no more mean that all candidates should command two foreign languages than we should today think of preparing roast pig only by burning the houses in which suckling pigs are bedded. And doctoral students who do need languages will vary greatly in their needs. For example, candidates in public administration and government who look to careers in the Far East will want Chinese, Japanese, and Russian much more than the traditional French and German.

Even a cursory examination of the tools actually used from day to day serves to reduce the importance of foreign languages in most research programs. Command of the professional and technical skills required for effective library work is much more commonly needed. And any research librarian can tell you that the average doctoral candidate has no greater competence in this regard than is expected of undergraduates. In our day research in most fields requires considerable statistical informa-

tion and skills which a random examination of even a hundred dissertations will show is apparently not possessed by either the candidate or his sponsor. Logic as an instrument of inquiry is a greatly neglected research tool as anyone can discover by examining the quality of reasoning exhibited in the same random sampling of dissertations. Furthermore, we live in an age of mechanical devices that are everyday tools of the productive research worker. Doctoral candidates likely to use or direct others in the use of calculating, tabulating, and measuring machines should be as free to acquire a command of these instruments as is the student who needs a linguistic tool more than he needs a mechanical one. Seemingly, the only tenable position is to set research requirements in terms of the probable life needs of the individual whose program is being planned, and to demand of him the same level of performance in their use that is asked of him in the subject matter on which he is working.

What should constitute the written and oral examination when a doctoral program is completed is also a mooted question. Doctoral candidates generally regard the preliminary or matriculation examination (to be discussed in the next section) and the dissertation as exceedingly difficult hurdles, but the final examination, especially the oral portion of it, has come to be looked upon as a "kangaroo court" for adding one last torment before admitting the already harried individual to "all the rights and privileges" appertaining to the Ph.D. degree. Too often, at such examinations, questions on general scholarly competence are formulated to see if the candidate understands the professional hobby or particular viewpoint of the questioner. And those related to a defense of the dissertation too often are sly pokes at the individuals and the department which sponsored the candidate.

I therefore suggest that the oral procedure be limited to the cross-examination on an initial defense of the thesis which the candidate has presented in his own way. When necessary the chairman of the examining committee should use the prerogative of a trial judge in ruling questions out of order. I suppose

this would entail developing precedents common in a court of law but as yet in rudimentary form as regards doctoral procedure. The written examination should be of the comprehensive type currently used in some undergraduate colleges. It would, of course, require a high order of powers of generalization, a full grasp of relevant facts, and penetrating insight into cause-and-effect relationships. The idea that a few professors can sit around a table and, by asking a candidate a series of unrehearsed questions, adequately test his scholarly grasp of a large area of knowledge expresses an outmoded conception of evaluation. The best thought of a staff should go into preparing appropriate instruments and into judging the quality of student response.

STUDENT PERSONNEL PROCEDURES

The three preceding chapters indicate widespread and often intense dissatisfaction on the part of employers and recent recipients of the Ph.D. degree with the graduate school's conception and administration of personnel machinery. Doctoral candidates enjoyed better attention as undergraduates, and industrial and governmental employers have far more efficient services for their own professional employees.

Most graduate schools were for long periods very small institutions where student and teacher had all of the close contacts commonly associated with the relationship of apprentice and master in guilds requiring long periods of training. These informal methods may still offer adequate services in the more sparsely populated half of the graduate schools that furnished data for this study. Nevertheless, these commendably human but individualistic and opportunistic practices are outmoded for use in the other half of the institutions where enrollments are large, and where such increases have been accompanied by a simultaneous diversification and multiplication of program offerings. These institutions need a systematic and comprehensive personnel organization in order to enable doctoral candidates to make the most effective use of their capacities in working with the institutional and field resources that are available to them.

A comprehensive organization for systematic personnel work with graduate students calls for a faculty sensitized to the need for working with individuals in the full knowledge that they are heirs to all the passions, anxieties, and ills that peculiarly beset the academic man. That is asking for a lot more than readiness to work with the individual as if he were a disembodied intellect. It means concern for the candidate's housing, his social life, his mental and physical health, his growth in the personal qualities employers say are essential to success—all this of course as a part of the main task of promoting a quality of intellectual growth for which the doctorate in philosophy may be conferred with pride. Mere talk about comradeship between budding and mature scholars is not sufficient for maintaining those fruitful relations that are commonly in evidence between learner and learned in law, medicine, and other professional schools.

It would, in my judgment, be a mistake for graduate schools to move from an amorphous personnel organization to an imitation of even the better and more comprehensive arrangements in undergraduate colleges. Throughout this report I have argued that doctoral work is fundamentally professional in nature and incentives. Both instructional and personnel procedures should more and more be shaped by this controlling fact. In actual practice, however, most administrative devices in graduate schools are essentially those of four-year colleges. Techniques of selection, registration, attendance, discipline, promotion, prerequisites, awarding fellowships, and for the most part of instruction and examination, are taken over with minor modifications from the procedure for undergraduates. What is needed is an administration of these affairs that is suited to the maturity and professional purposes of advanced graduate students.

How is this to be brought about? I suggest that we begin to bring clarity into the pattern by enlarging the role of the chief personnel officer, the dean of the graduate school. Half facetiously, Howard Mumford Jones of Harvard University says:

In most institutions the graduate dean can be described as the

head of a school that does not exist, over which he presides for the sufficient reason that it never meets. He does nothing in particular, but he is subjected to heavy criticism unless he does it very well.⁸

The plain truth is that most graduate deans have few identifiable professional functions in either administration or instruction, however salutary their influence may be through powers of suasion and example. It is a hard saying, but the initiated know that the dean's office is largely a façade behind which the departments carry on the essential administrative and instructional functions. Indeed, most graduate deans take office with the tacit understanding that during incumbency they may continue undiminished their own research and teaching interests. Until the graduate faculty is willing to clothe the dean with at least the authority and functions common among law and medical schools there is little use in talking about the introduction of personnel procedures or other administrative devices for integrating graduate work. At present there is no unifying force in the very heart and core of the graduate school.

I of course recognize that the chief personnel officer will not always be the graduate dean, but he is so designated in the twenty-two institutions that conferred 75 percent of the degrees reported on in this study. If the graduate school is not large enough to have its own full-time administrative officer, the university usually is small enough for the president to perform the integrating functions—if he is otherwise qualified. The president of Johns Hopkins University, for example, has since its founding discharged the duties commonly assigned to the dean or director of graduate studies. Other things being equal, such an arrangement is to be preferred over having the dean of some undergraduate college administer graduate work as an adjunct to and by the standards of his undergraduate duties. It is also a better arrangement than designating as the director of graduate studies some staff member who, regardless of his indi-

⁸ Howard Mumford Jones, *Post-War Planning for the Graduate Schools* (New Orleans: Conference of Deans of Southern Graduate Schools, Tulane University, 1943), p. 3.

vidual qualifications, has no authority to perform the indispensable coordinating functions.

Recruiting graduate students

The data in Chapters II and III of this report seem to indicate that the graduate school of the future should deliberately make a selection of those teaching, research, and administrative occupations for which it will prepare candidates for the doctorate in philosophy. In turn, this requires of graduate schools which want to be of maximum benefit to doctoral candidates and to society that they face realistically (as medical schools have for some time done) all of the issues inherent in a professional type of selective admissions, counseling, restricted offerings, and effective placement. After war shortages in doctoral personnel are made up, it is likely that for the next score of years society will demand a relatively small number of soundly educated and functionally trained doctors of philosophy.

The weak, overexpanded, or indiscriminately ambitious graduate school is not likely to welcome or follow recruitment policies that have proven their worth in medical colleges and other professional schools. They are more likely to continue to go into the academic highways and byways inviting whomever has a master's degree to matriculate for the doctorate. They are likely to continue trying to maintain enrollment through grants-in-aid which thinly subsidize more than three-fourths of their doctoral candidates. Those who have studied graduate student aid even go the length of asserting that if grants were reduced to the proportion customarily given in professional schools, as many as one-fourth of our doctoral-level graduate schools probably would be without students.

Table II (pages 43-45), which shows where 22,509 Ph.D. degrees were earned and the 1940 location of 19,776 of the degree holders, makes it evident that recruitment for most graduate schools is a state or regional undertaking. This generalization is corroborated by data from the Association of American Universities which indicated that in 1940 only ten member institutions recruited 50 percent or more of their students from outside the state. The information showed further that tax-

supported institutions secured approximately one-third of their graduate students from their own undergraduate colleges, and that the corresponding figure for privately supported institutions was one-fifth. The varying situation with respect to selection and admission is indicated by the fact that one member institution rejected more than 50 percent of the applicants, three rejected from 40 to 50 percent, three rejected from 20 to 30 percent, and ten rejected 15 percent or less. Two institutions rejected no applicants and fourteen failed to report their practice.

College and university bulletin boards attest to the fact that the announcement of fellowships is the graduate school's most frequently used recruiting device. A greater use could be made of placement history, the careers for which preparation is offered, and of the faculty and material resources available in the several major fields. Perhaps minimum use is being made of the word-of-mouth recommendations that earlier recipients of the degree might supply if graduate school officials were more effective in follow-up activities. Undergraduate faculty members on the local campus might also be encouraged to recommend their best students to the graduate school. Graduate professional schools often get the cream of the undergraduate student body. Even the graduate school that has more applicants than it can now accept should be encouraged to compete for the very superior individuals.

The question of how recruiting should be conducted is complicated by the fact that graduate schools today are really un-integrated groups of schools. Heretofore their composite nature has been recognized more than their potential unity. Each department has largely handled its own recruiting, especially as it is done through the use of fellowships, assistantships, and other forms of grants in aid of doctoral study. This policy has led in most universities to "have" and "have not" departments in competition with one another. The course of action most likely to improve the situation probably will be earnestly opposed by representatives of the strong departments. Nevertheless, instead of the department "owning" the stipend and selecting the fellow with the dean merely appointing him, fellowships should

belong to the graduate school as such and the dean and his council should select and appoint fellows on the basis of data supplied by all departments. And since the purpose of aid is to attract and hold doctoral candidates of the highest possible caliber, stipends should be large enough (even if the number must be reduced) to enlist the competition of men and women of outstanding excellence.

Admission, counseling, and placement

The concepts which, in my opinion, should govern selection before and after admission to graduate study as well as a suggested general framework for counseling at the graduate level have already been stated. With respect to personnel service to advanced students, accordingly, all that seems called for at this point is a brief statement of appropriate procedures.

There is no need to reiterate the impracticability of trying to formulate specific recommendations for so diverse a group of institutions as American graduate schools. Each institution should be expected, for example, to handle initial selection in terms of its own situation. At Princeton University graduate enrollment is primarily for the Ph.D. degree and definitely limited. In normal times there are twice as many applicants as can be admitted. These circumstances encourage extensive testing, interviewing, and counseling before admission is granted. But no such procedure is feasible at the University of Wisconsin, for example, where enrollment is not restricted, where most applicants are interested in the master's degree, and where the 10 percent or so that later matriculate for the doctorate make their decision to do so only after a year or more on the campus. Differences in size aside, Wisconsin obviously will have to have a larger and more comprehensive personnel service if it is to help so heterogeneous a population in analyzing and serving its vocational purposes. Doctoral education for such a group is critically dependent on informed and insightful counseling.

While any sizable graduate school that still relies only on the dean and the department heads for all matters of admission and counseling undoubtedly needs to overhaul its setup, the best way to do so can be discussed only with reference to the larger

setting in the university. The graduate school will of course make use of the medical, psychiatric, and psychological services provided for the entire campus. The testing bureau can probably provide assistance by means of the Carnegie Foundation's Graduate Record Examination when it comes to discovering the nature and range of an applicant's general information and his relative mastery of factual knowledge in his field of major interest. But this bureau must work closely with the graduate department concerned if the diagnostic values of this instrument are to play any part in instruction. The same generalization holds for personality analyses. The doctoral graduates who were quoted in Chapter VI did not complain of any lack of formal personnel services, but rather of the absence of any carryover from them to the warm, human counsel of competent and understanding professors.

To turn to the placement and follow-up aspects of doctoral work, it will be recalled that those college appointing officers who expressed opinions were almost unanimous in their dissatisfaction with the way graduate schools handled such matters. They claimed that ordinarily no one connected with the graduate school or even the university knows enough of what employment opportunities require to say with any certainty that a given candidate is properly prepared. Neither, they asserted, is enough known about the candidate as a human being to give assurance that he is likely to adjust easily to living in the environment where he will be employed. They believed they got even less satisfactory service when they consulted the bureau primarily responsible for placing undergraduates. No one from outside the institution concerned should presume to say what precise organization is best calculated to improve the situation complained of. It is, however, abundantly clear that no mechanical setup will provide a remedy unless it succeeds in increasing faculty sensitivity to the real needs of the field and in enriching their knowledge of students as human beings.

Follow-up activities are of course closely related to effective placement. Those graduate schools that could quickly and easily provide data on training and placement for this report had effective procedures in this regard. But many graduate schools

were not able to send the data immediately. One institution reported that it spent \$500 in addition to valuable staff time in learning the whereabouts of its doctoral graduates for a single decade. Incidentally, the institution thanked the study for the stimulus and indicated that it had made provision for keeping the information up to date. The University of Chicago and Stanford University are among the institutions known to have made periodic follow-up surveys and to have analyzed the findings for guidance in improving graduate instruction.

IN CONCLUSION

The reader will doubtless have noted that the suggestions made in this chapter for improving graduate study are mutually dependent and all of a piece. The two basic assumptions with which the study began furnish the foundation for everything else: (1) doctoral programs must be adjusted to the uses to which recipients can put the degree in the scheme of American life today, and (2) the graduate school must function as an integrated organism—rather than an aggregate of competing departments—if it is to be able to fulfill its mission. All details of instructional method and administrative procedure can be worked out naturally and constructively when a cooperative attack is made on the problem of meeting socially significant needs.

As far as the former are concerned, they comprise individualized study in the major field well integrated with supporting subjects and cultural activities, all determined by the actual requirements of each case. The administrative arrangements to reinforce this instruction should cover selective admission, individual counseling with emphasis on the student's self-appraisal, financial assistance, realistic and conscientious placement, and follow-up for the sake of continuous check on the program. The details through which this broad policy should be implemented must be worked out on each separate campus on the basis of local conditions, values, and resources. That beginnings are already under way in this direction, uneven and scattered as they may be, gives ground for at least a measure of sound optimism.

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GEORGE F. ZOOK, *President*

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